PARAMETER RESETTING AND LEARNABILITY IN THE ACQUISITION OF FRENCH AND SPANISH BY ADULT NATIVE SPEAKERS OF ENGLISH

By

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PREFACE

How do adults acquire a second language? This experimental study addresses this very broad question from two perpectives. Within a learnability perspective, the principle to be investigated is the Subset Principle and the predictions that can be made based on a superset/subset relation. Within a parameter resetting perspective, the purpose of this study is to investigate whether the following syntactic properties--preposition stranding, dative alternation, dative passive and Exceptional-Case marking--do cluster and how they may be acquired. This study looks at the acquisition of English by adult learners of French or Spanish.

Our point of departure is the principles and parameters approach to Universal Grammar (UG), as realized in Government and Binding (GB) Theory (Chomsky 1981c). "This theory assumes that principles and parameters of UG constitute an innately given body of knowledge which constrains first language (L1) acquisition" (White 1989c). Assuming this approach to be correct, the question arises as to whether UG is still available in second language acquisition.

The parameter resetting approach and the learnability perspective make both similar and competing predictions as far as second language acquisition is concerned. First, both approaches predict that the acquisition of the cluster of syntactic properties will take place based on positive evidence alone. Within a parameter resetting perspective we assume that it is the positive evidence present in the input that will trigger the acquisition of the properties subsumed under a parameter. The acquisition of any property will trigger the acquisition of the remaining properties. Furthermore, once a property has been acquired, the acquisition of the other properties should follow whether or not there is any kind of evidence available, positive or negative. Within a learnability perspective, it is claimed that the learners should entertain the smallest hypothesis compatible with the positive evidence available to them in the input. However, the parameter resetting approach predicts that the properties will be acquired simultaneously as a cluster. In contrast, the learnability perspective breaks up that cluster by predicting that the properties will be acquired individually in a particular order, based on the positive evidence available to them.

Chapter 1 presents an overview of the learnability constraints and learning principles which may guide first language acquisition, but not second language acquisition. Second language learners face different situations depending on the various grammatical properties of their native language and the target language. It is shown that this fact opens up various possibilities within a learnability perspective and a parameter resetting perspective. Chapter 2 reviews the linguistic theory concerning the cluster of syntactic properties to be investigated in this study within a parameter resetting perspective, and outline the predictions which can be made within that perspective. Chapter 3 examines the relevant second language literature and introduces the second perspective and its predictions adopted in this study, the learnability perspective. Chapter 4 outlines the experimental study which consists of a grammaticality judgment task and a correction task. Chapter 5 restates the hypotheses and predictions made within the parameter resetting perspective and the learnability perspective, and reports the results of both experimental tasks. In Chapter 6, these results are summarized and relevant conclusions are drawn.

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Abstract of Dissertation Presented to the Graduate School
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PARAMETER RESETTING AND LEARNABILITY IN THE ACQUISITION OF FRENCH AND SPANISH BY ADULT NATIVE SPEAKERS OF ENGLISH

By

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Major Department: Romance Languages and Literatures

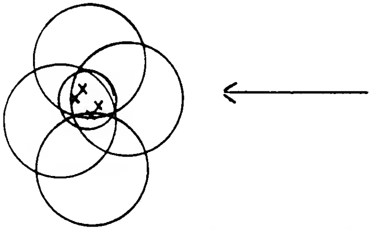
This dissertation investigates the second language acquisition of a cluster of syntactic properties--preposition stranding, Exceptional-Case marking, dative alternation and dative passive--from a learnability perspective and a parameter resetting perspective. The experimental subjects are adult native speakers of English at various stages of acquisition of French or Spanish, as well as a control group of native speakers of French and Spanish. The subjects were asked to perform a grammaticality judgment task and a correction task to test several hypotheses. Within a parameter resetting perspective, it is hypothesized that if the properties do cluster, the acquisition of any property would trigger the acquisition of the remaining properties based on positive evidence. Within a learnability perspective the acquisitional sequence of the proposed properties should show that second language learners follow the Subset Principle. The stimuli consist of 50 sentences randomly distributed. The French and Spanish data include grammatical and ungrammatical sentences. All the equivalent English sentences are grammatical. Instances of preposition stranding include ten grammatical sentences with pied piping: five declaratives and five wh-interrogatives; and ten ungrammatical sentences with preposition stranding: five declaratives and five wh-interrogatives. Instances of Exceptional-Case marking and dative passive include five grammatical and five ungrammatical sentences. Instances of dative alternation include five double object constructions, ungrammatical in French and Spanish, and five prepositional constructions, grammatical in French and Spanish. The results do not indicate strong support for the parameter resetting hypothesis nor for the learnability hypothesis. Subjects successfully acquire some of the properties tested but fail to acquire others. However, it is argued that the results show that subjects are acquiring the properties tested based on positive evidence available to them. It is concluded that direct or indirect negative evidence may be necessary for second language learners to constrain an L2 grammar when the L1 is a superset of the L2.

CHAPTER I
INTRODUCTION

Learnability Theory in First Language Acquisition

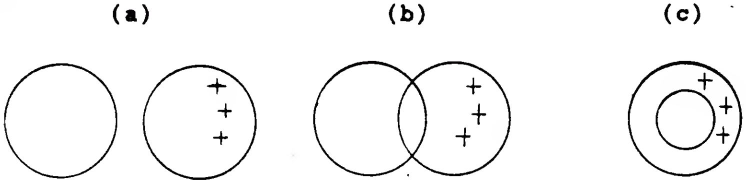
Pinker (1989) argues that first language acquisition in general can be seen as follows. The child hears a finite number of sentences symbolized by the X's in (1). He or she must generalize from these finite sentences to an infinite number of sentences which not only include but also go beyond the input sample. This is represented by the circle with the arrow pointing to it. The other circles symbolize the infinite number of hypotheses which are consistent with the input sample but differ from it and from the correct hypothesis.

(1)



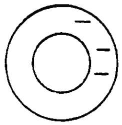
In the L1 acquisition and learnability literature, it is usually accepted that learnability constraints and learning principles such as the Subset Principle (Berwick 1985; Wexler and Manzini 1987) and the Uniqueness Principle (Wexler 1981; Roeper 1981; Berwick 1985) prevent the L1 learners from producing over-inclusive grammars. Such constraints or principles allow the children to formulate only conservative hypotheses, so that language learning can proceed based on positive evidence alone. According to Pinker (1989, pp. 5-6), there are three different ways in which the child can formulate incorrect hypotheses which will be disconfirmed by positive evidence. First "the child's language can be disjoint from the target language" (p.5) as in (2a). Second, the language generated by the child's hypothesis may intersect with the target language as in (2b). Or, as claimed by the Subset Principle, the child may entertain an hypothesis which is a subset of the target language as in (2c). In all three cases the "+" symbol represents the positive evidence available to the child. That positive evidence allows the child to reject an incorrect hypothesis.

(2)



If the children were to formulate 'wild' hypotheses about the input, they would need to have access to and be able to use negative evidence in order to disconfirm these incorrect hypotheses. This is represented in (3): if the child overgeneralizes by entertaining a grammar which generates a superset of the target language, positive evidence will not be enough to disconfirm the wrong hypotheses. Negative evidence will be necessary.

(3)



Baker (1979) has pointed out a number of learnability paradoxes which illustrate the fact that children do manage to avoid, or unlearn, overgeneralization mistakes, when they do not use negative evidence (Braine 1971, Brown & Hanlon 1979) or when negative evidence is ineffective (Pinker 1989). The acquisition of the English dative alternation is one of these learnability paradoxes. Mazurkewich and White (1984) argue that children do overgeneralize until positive evidence in the input allows them to realize the morphological and semantic constraints which apply to dative alternation. They report that 46.7% of the following ungrammatical sentences were judged to be grammatical by the group of 9-year-olds:

(4) a. David suggested Jack the trip

b. Tom reported the police the accident

c. Cathy described Lisa the movie

There are also some anecdotal examples of younger children who do not seem to be aware of the semantic constraints governing the dative alternation:

(5) Mummy, open Hadwen the door (speaker aged 6;0)

(cited in Mazurkewich & White 1984, p.270).

In White (1987a), it is suggested that overgeneralization of the double-object construction does occur and cannot be dismissed as random performance error on the part of the children. However, as Gropen et al. (1989) point out, Fodor (1985) had already suggested that the "reported instances of overgeneralization in children's spontaneous speech are probably rare (e.g. compared to obvious overgeneralizations like eated); the reports include little information about sample size, and there is therefore no way of estimating the relevant baselines" (p.208-9). Furthermore, Fodor (1985) also mentions possible methodological problems in the experimental studies carried out by Mazurkewich and White (1984).

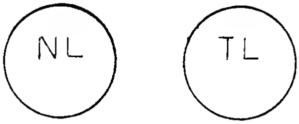
Gropen et al. (1989) claim that although children are not invariably conservative, they do show conservative tendencies, and their overgeneralizations are influenced by morpho-phonological and semantic criteria. In other words, the importance of the overgeneralizations presented by Mazurkewich and White (1984) is downplayed by Fodor (1985) and Gropen et al. (1989). The latter study also minimizes the conclusions reached by White (1987)--to stress the regularity of first language acquisition. Gropen et al. (1989) explain the lack of overgeneralization errors first by pointing to the evidence that adultlike meanings are often acquired quite slowly (Gentner 1975, 1978, 1982; Bowerman 1978). Incorrect verb meanings combined with correct rules would lead to syntactic errors according to the theory, and as verb meanings are refined, these syntactic errors should disappear (Gropen et al., p. 250). Their second explanation is based on the assumption that children do not differ from adults after all and that adult innovations in the use of dative alternation are very similar to the so-called overgeneralizations produced by children in that:

> both adults' and children's innovations obey some version of the possession-change constraint, and both are rare, occurring against a background of conservatism or the minimal exceptions to it licensed by narrow-range rules. Both children and adults, then, may possess a broad-range dative rule mapping cause-to-go forms onto cause-to-have forms, and may occasionally use them productively for one-time innovations in addition to their main function of licensing and motivating more low-level lexical alternations.
> (Gropen et al., p.252)

Learnability Theory in Second Language Acquisition

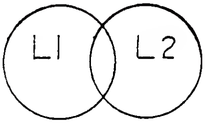
Second language learners face different situations depending on the various grammatical properties of their native language and the target language. For example, the NL and the TL may permit such different properties (e.g., the NL is a head-first language whereas the TL is a head-last language) so that no persistent transfer effects from the NL to the TL are attested. This is illustrated by the diagram in (8a).

(8a)



Or the L1 and the L2 may partially overlap, leading the learner to initially hypothesize that the L2 grammar is identical to his/her L2 grammar. This is illustrated in (9a):

(9a)



For example, French and English partially overlap as far as dative alternation goes since English allows both prepositional structures and double object structures, while French allows only prepositional structures (see examples in 10 and 11). An English native speaker learning French may initially believe that French allows both dative forms.

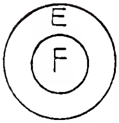
In terms of superset/subset relations, learners may need to start with a subset and build a superset or, on the other hand, they may have to go from a superset to a subset. For example, French learners of English may start with [NP PP] as the only possible dative construction and will have to learn that English allows not only the [NP PP] structure but also the [NP NP] structure.

(10) a. Mark gave the letter to Paul
    b. Marc a donné la lettre à Paul

(11) a. Mark gave Paul the letter
    b. * Marc a donné Paul la lettre

In that case French is a subset of English, as can be seen in (12):

(12)



An English learner of French will provide the example of a learner proceeding from a superset to a subset. It is the latter possibility which does seem to raise the most interesting questions in second language acquisition learnability since, as White (1990) points out, learners do not seem to observe the Subset Principle (van Buren 1987). Rather they tend to adopt grammars which generate a superset of the structures actually allowed in the L2. In other words, second language learners whose native language constitutes a superset of the target language, will produce or accept ungrammatical sentences because they lack the principles and constraints imposed on first language acquisition. This suggests, as White (1990) proposes, that negative evidence may be useful or even necessary. Birdsong (1989) argues that "negative evidence is necessary in L2 acquisition in order to disconfirm certain types of hypotheses about grammatical structure" (p.131). One type of hypothesis which seems to require negative evidence for disconfirmation is the free variation hypothesis where the learner assumes that two forms coexist in free variation, i.e. are equally possible.

Birdsong (1989) reports a personal anedocte about a Spanish native speaker barber who seemed to entertain a free-variation hypothesis when referring to the word 'hair,' whereby the plural and singular would be in free variation. The English speaking customers would use singular pronouns when referring to 'hair,' but the Spanish and French Canadian speaking customers would use singular and plural pronouns. These facts may have led the barber to entertain a free-variation hypothesis concerning plurality. Schachter (1986) suggests the case of uninflected verb complements in which the subject of the complement differs from the subject of the main sentence. Schachter argues that the examples in (13a) could induce the learner to hypothesize the pattern V + NP + V with an optional *to* between the NP and the second verb. The learner could produce grammatical but also ungrammatical structures as in (13b):

(13a) - Data available to the learner:

I want him to go
John expects me to go
They told the men to leave
We helped her find a place

I made him go
We had him polish the floor
They let the children cross the street
I helped him wash the dishes

(13b) - Data produced by the learner

I want him to go
* She made him to go

I made him go
* I want him go

In the absence of negative evidence, the learner would have "to figure out which nonoccurring sentences could not occur!" (Schachter 1986, p. 219).

It is usually agreed (see e.g. Birdsong 1989, p.184) that L1 learners do not entertain free variation hypotheses because they are guided by the Uniqueness Principle (Wexler 1981; Roeper 1981; Berwick 1985) or one of its derivatives, the Principle of Contrast (Clark 1987). Under these learning principles, learning is constrained by the assumption that if there is a difference in form there is a difference in meaning. It follows that when two forms appear to be synonymous, one preempts the other.

Thus, if second language learners were guided by the same learning principles, and if they happened to entertain a free-variation hypothesis, they should be able to preempt one over the other. Unfortunately, this does not appear to be the case, since as Birdsong (1989) speculates, the Uniqueness Principle, "which represents a procedural linchpin in the mechanisms of hypothesis testing without negative evidence, is rejected in the course of linguistic development as the result of heightened metalinguistic awareness, and may not be applied by adult L2 learners" (p.131).

It is then concluded that second language learners would need negative evidence to preempt the wrong forms. Otherwise, they would not know which non-occurring form cannot occur and they would continue to entertain free-variation hypotheses, ultimately leading to fossilization.

Carroll & Swain (1991) found that, when taught the morpho-phonological and semantic constraint on English dative alternation, Spanish learners were able to benefit from positive input plus negative feedback, at least temporarily. All their experimental groups, who were exposed to different types of negative evidence, performed significantly better than the comparison group (it is not specified who the subjects in the comparison group were), who did not receive any feedback. The subjects were divided in four groups. The subjects in Group A were given an explicit hypothesis about how alternation works and were told that this hypothesis was wrong. This type of feedback was called Explicit Hypothesis Rejection. Subjects in Group B were simply told that they were wrong whenever they made a mistake. This was called the Explicit Utterance Rejection. Subjects in Group C were given a reformulated correct response. This feedback was considered to be modelling and was called Implicit Negative Feedback. Whenever subjects in Group D made a mistake, they were asked if they were sure of their response. This feedback was called Indirect Metalinguistic Feedback.

As far as dative alternation is concerned, English constitutes a superset, allowing both the [NP PP] and the [NP NP] structures, whereas Spanish allows only the former:

(13) a. John gave a book to Mary

b. Juan le ha dado un libro a Maria

(14) a. John gave Mary a book

b. * Juan le ha dado Maria un libro

Thus some type of negative evidence may indeed prove to be particularly useful, if not necessary, in superset/subset cases where the learner may need negative evidence to adopt the correct L2 grammar. White (1991) attempted to determine whether the L2 learner would transfer L1 argument structure in the L2 when the structure in question does not occur in the L2 input. The subjects were three groups of English children undergoing partial immersion, total immersion, and submersion in French. A preference task and a judgment task were used to test double-object structures and adjacency (which included adverb placement). As predicted, it was found that L1 subcategorizations of dative verbs were accepted in the L2 by all experimental groups, confirming results reported in White (1987b). When the L2 was the superset, the Partial Immersion and Submersion groups were conservative, tending to prefer the forms which were acceptable in both the L1 and L2. However, these results were only based on a preference task and were not replicated with a grammaticality judgment task.

Parameter Resetting in Second Language Acquisition

One of the goals of linguistic theory within a generative framework is to explain language in terms of principles of

Universal Grammar rather than language-specific rules. "In a highly idealized picture of language acquisition, Universal Grammar is taken to be a characterization of the child's pre-linguistic state" (Chomsky 1981, p.31). In addition, a number of these abstract principles of Universal Grammar are associated with parameters, so that "the grammar of a particular language can be regarded as simply a specification of values of parameters of UG, nothing more" (Chomsky 1981c, p.31). Thus languages vary depending on which parameter setting is adopted. One of the first principles to be proposed was the principle of structure-dependency which seems to be common to all languages. The principle of structure-dependency asserts that "operations on sentences such as movement require a knowledge of the structural relationships of words rather than their liner sequence" (Cook 1988, p.6). In first language acquisition, the parameter values are set by positive evidence alone and the acquisition of any property triggers the acquisition of the remaining properties. The setting of a parameter to a particular value has drastic effects on language. For example, the Head Parameter specifies the position of heads of phrasal categories. All languages have phrases (PP, VP, NP, etc) which contain heads (P, V, N, etc) and the position of the head within the phrase varies from language to language yielding languages as different as English and Japanese. English is head-initial since the complements appear to the right of phrasal heads, whereas Japanese is head-final because the complements are to the left of heads. This choice between head-first or head-last is reflected in the respective word orders SVO and SOV, in the order within NPs, with relative clauses either preceding or following their head, as well as in the orders of other phrase types. "Ideally, we hope to find that complexities of properties differentiating otherwise similar languages are reducible to a single parameter, fixed in one or another way" (Chomsky 1981c, p.6).

This concept of parametric variation opens various possibilities in second language acquisition since the first language and the target language may have similar or different parameter settings. The question is whether the second language learners are able to adopt a different parameter setting when the parameter values differ for the L1 and the L2. In other words, are second language learners able to reset parameters to the appropriate L2 value based on the available positive evidence? As White (1989) argues:

> Since many parameters link clusters of syntactic properties, one needs to look for evidence of clustering in second language acquisition. Clustering should be expected both in the case where the learner carries over the L1 value of a parameter and where the L2 value is achieved. Learners who transfer the L1 value of the parameter ought to transfer the whole cluster of properties. When learners acquire a parameter setting relevant to L2, all properties associated with it should be acquired together. (p.82)

The second language acquisition literature offers many examples of previous attempts to show evidence of parameter resetting. Phinney (1987), White (1985, 1986), Liceras

(1986) and Hilles (1986) investigated whether second language learners acquired all the properties of the pro-drop parameter. It appeared that there was transfer of the L1 parameter setting, and sometimes, resetting to the L2 value. But as far as clustering is concerned, only some of the properties associated with the parameter were evidenced in second language acquisition.

We propose to study the acquisition of a potential parameter, the Oblique-Case parameter, which holds a cluster of apparently unrelated phenomena: dative alternation, dative passive, preposition stranding and Exceptional-Case marking. The experimental subjects will be three groups of English native speakers learning French and three groups of English native speakers learning Spanish. A parameter resetting perspective will be adopted in an attempt to find out if the properties will cluster and how they may be acquired.

Chapter 2 will review the linguistic theory concerning the cluster of syntactic properties to be investigated in this study within a parameter resetting perspective, and will outline the predictions which can be made within that perspective. Chapter 3 will review the relevant second language acquisition literature and will introduce the second perspective and its predictions adopted in this study, the learnability perspective. We will see that the parameter resetting perspective and the learnability perspective make similar and competing predictions.

CHAPTER 2
REVIEW OF LINGUISTIC THEORY

This chapter reviews the four syntactic properties to be tested in this experimental study:

1 - Preposition stranding

2 - Exceptional-Case marking

3 - Dative alternation

4 - Dative passive.

Kayne (1981, 1983) claims that these apparently unrelated phenomena of French syntax can be explained in a unified account within the framework of Government and Binding adopted here. And Chomsky (1981c, p.297) suggests that all four properties may be subsumed under a single parameter. If this is indeed the case, we will be able to test the acquisition of these syntactic properties by second language learners of French and Spanish (we will see that French and Spanish exhibit the same characteristics as far as preposition stranding, Exceptional-Case marking, dative alternation and dative passive are concerned) from a parameter resetting perspective.

The following assumptions of Case Theory are necessary:

a - According to Chomsky (1981c, p.170), the fundamental properties of Case assignment are

(1) (i) NP is nominative if governed by AGR

(ii) NP is objective if governed by V with

the subcategorization feature: ____NP (transitive)

(iii) NP is oblique if governed by P

(iv) NP is genitive in [np____X]

(v) NP is inherently Case-marked as determined by properties of its [___N] governor

(i)-(iv) correspond to structural Case; (v) is inherent case and is only found in double NP constructions such as

(a) - Mary sent Bill a letter

b - According to Chomsky (1981c, p.172), "in English, only the [-N] categories, verb and preposition, are Case-assigners. In OB, it is assumed that verbs assign objective Case, and that prepositions assign oblique Case apart from marked properties". Chomsky (1981c) assumes with Kayne (1979) that in English both verbs and prepositions assign objective Case, because the richer Case systems have been lost. However, Chomsky (1981c, p.293) suggests a slight modification of that proposal: the Case system may be lost in English only within VP, whereas PPs that are immediate constituents of S' have inherent Case-marking.

c - English prepositions have the property of assigning objective Case, which is the Case normally assigned by a verb to its direct object. In contrast, French prepositions assign only oblique Case. Contrary to English, they do not have the property of assigning both Cases. Kayne (1983) argues that it is this distinction between French prepositions and English prepositions that accounts for various properties of French and English, as well as Spanish, which like French, does not allow preposition stranding, dative alternation, Exceptional-Case marking, nor dative passive. Thus English prepositions have the property of assigning oblique Case as well as objective Case, whereas French and Spanish (which is similar to French in that respect) prepositions assign only oblique Case. Let us see how these facts may provided a unified account of the syntactic properties to be tested in this study.

Preposition Stranding

English, but not French or Spanish allows preposition stranding in wh-constructions and in passives:

(9) a. which candidate did you vote for?
b. * quel candidat as-tu voté pour?
c. * ¿cuál candidato has votado por?

(10) a. John was voted against by almost everybody
b. * Jean a été voté contre par presque tous
c. * Juan fue votado contra por casi todos

Kayne (1979b) adopts the following approach in terms of Case theory:

- inherent Case is assigned at D-Structure
- structural Case is assigned at S-Structure
- English has lost the inherent Case system: prepositions do not assign inherent oblique Case but rather structural objective Case, as do verbs
- French prepositions assign oblique Case

The permissibility of preposition stranding in English would then follow from the presumably marked loss of oblique Case assignment in English. Weinberg and Hornstein (1978) note that stranding is restricted to PPs that are within the VP. They propose that a reanalysis rule within the VP creates a complex verb including the preposition, the NP object of the preposition becoming the object of the complex derived verb, hence accessible to movement in the normal way; movement of the object of a preposition that is not reanalyzed in this way is excluded by a filter that blocks empty oblique elements assuming that P assigns oblique Case while verbs assign objective Case (Chomsky 1981c, p.292).

Kayne (1981) argues that what imposes reanalysis is the Empty Category Principle, rather than Hornstein and Weinberg's Filter since French does have reanalysis rules: one reanalysis rule involves causatives and another reanalysis rule involves idiomatic expressions. So rather than interpreting the lack of preposition stranding in French as resulting from the absence of a reanalysis rule, Kayne suggests that it results from the absence of a reanalysis rule involving prepositions. French lacks such a reanalysis rule involving prepositions because, according to Chomsky (1981c, p.293), a reanalysis between two lexical categories is possible only if they assign Case in the same way. Kayne (1981) modifies that reanalysis principle within the framework of government: reanalysis between two lexical categories is possible only if they govern in the same way. We have already seen that in English P and V govern in the same way, whereas in French they do not. A reanalysis rule involving prepositions is therefore impossible, and this explains why preposition stranding is ungrammatical in French. V-V reanalysis is possible in French because it involves the same categories. And V-P reanalysis is possible in English because V and P govern the same way, but not in French, because it involves two different categories which govern differently.

Thus it is concluded that although preposition stranding occurs in English, it is not allowed in French or in any other Romance Languages (Zribi-Hertz 1984, Pollock 1989). King and Roberge (1990) attempt to challenge that conclusion by arguing that the following sentences are instances of preposition stranding in Prince Edward Island Canadian French (PEIF):

(11) a. Qui-ce tu vas à Ottawa à-travers-de?
Lit.: 'Who are you going to Ottawa through?'
b. Quoi-ce tu travailles dessus?
'What are you working on?'
c. Qui-ce tu as fait le gâteau pour?
'Who did you make the cake for?'
d. Le ciment a été marché dedans avant d'être sec
'The concrete was walked on before drying'
e. Tu connais pas la fille que je te parle de
'You do not know the girl that I am talking to you about'

PEIF is in a minority position with respect to English in the province of Prince Edward Island and it is reasonable to assume that this dialect of French is strongly influenced by English. King and Roberge (1990) themselves indicate that PEIF includes a number of prepositions of English origin contrary to Québec French, for instance, which has borrowed verbs but no prepositions from English. So the fact that PEIF exhibits instances of preposition stranding can be attributed to structural borrowing. It is limited to that dialect of French and cannot be extended to other varieties of French or Standard French. Therefore we may still assume that the preposition stranding, Exceptional-Case marking, dative alternation and dative passive may constitute a cluster of syntactic properties subsumed under the Oblique-Case parameter. However, if preposition stranding was indeed acquired as part of the PEIF grammar, and if it could be demonstrated that PEIF prepositions actually assign Case the same way English prepositions do, then these instances of preposition stranding would constitute counterevidence to the Oblique-Case parameter.

Kayne shows that the distinctions between French and English about Case assignment can be extended to explain another syntactic difference between the two languages: Exceptional-Case marking.

Exceptional-Case Marking

(12) a. I believe [John to be the most intelligent of all]

b. * Je crois [Jean être le plus intelligent de tous]

c. * Creo [Juan ser el más inteligente de todos]

(13) a. Quel garçon crois-tu [t être le plus intelligent de tous]

According to Kayne (1981), a comparative analysis of the complementizer systems of French and English will bring out the relation between preposition stranding and ECM. De and for are both infinitival complementizers. There are two major differences between them:

- for can be followed by a lexical subject of the infinitive but de cannot:

(14) *ce serait dommage de quelque chose lui arriver

(15) it would be a pity for something to happen to him

- de is compatible with control, for is not

(16) ce serait dommage de partir maintenant

(17) * it would be a pity for to leave now

Example (14) is a straight violation of the Case Filter if we assume that de cannot assign Case to the subject of the infinitive whereas for can. Example (12a) is usually explained by assuming that S'-deletion takes place; this is a marked property of the English verb believe and similar verbs. However, Kayne (1981) assumes that there is no S'-deletion, but rather a zero complementizer 0, a preposition which governs and assigns Case, a complementizer analogous to for. This is essentially the analysis of Chomsky and Lasnik (1977). If this is right, then English and French do not differ in the structures assigned to the examples (12)(a) and (b). In each case there is a 0-complementizer.

Kayne suggests that, once again, the basic difference between French and English is that an English preposition (here 0) assigns Case and governs in the same structural way as the verb, whereas in French a preposition governs and assigns Case only inherently to an NP and its subcategorization frame. Thus 0 neither governs nor assigns Case to the subject of the infinitival construction in (12)(b).

Therefore, a single principle accounts for the differences between French and English with regard to preposition stranding and Exceptional-Case marking. That principle can be informally stated as a difference in the way English and French prepositions govern. English prepositions have the property of assigning objective Case as well as oblique Case, whereas French prepositions can only assign oblique Case.

Dative Alternation

(18) a. John gave Mary a book
     b. John has left his children a great deal of money
     c. They sent John a registered letter

(19) a. * Jean a donné Marie un livre
     b. * Juan le ha dado Maria un libro
     c. * Jean a laissé ses enfants beaucoup d'argent
     d. * Juan le ha dejado su niño mucho dinero
     e. * Ils ont envoyé Jean une lettre recommandée
     f. * Le han mandado Juan una carta registrada

(20) a. John gave Mary a book

b. John gave a book to Mary

Oehrle (1976) proposed a base analysis for (3) without NP-movement, and without a preposition present at every stage of the derivation. Kayne agrees that there is no NP-movement, but argues that a preposition is present at every stage of the derivation, in a way more in the spirit of trace theory than would a to-deletion rule.

(21) Jean a essayé de chanter

The rule of equi-NP deletion that derived (21) from '. . . de Jean/lui chanter . . .' by deleting the subject of the infinitive, has given way to the idea that (21) contains an empty pronominal subject at every stage of the derivation: de PRO chanter. Similarly, it is suggested that (22) contains an empty preposition Pe, at every stage of its derivation:

(22) V [pp Pe NP] NP

The difference between French and English regarding dative alternation can now be explained in terms of Case theory:

(23) An empty preposition cannot be the source of Case

Thus in (20) Mary is not directly assigned Case by Pe, but by V through percolation. This is possible because P and V assign Case in the same way as seen before. It follows that the double object construction is ungrammatical in French: it is a violation of the Case Filter since only one NP is assigned Case. Case cannot be assigned by percolation through V since in French P assigns oblique Case whereas V assigns objective Case.

Dative Passive

(24) a. John was given a book by Mary

b. * Jean a été donné un livre par Marie

c. * Juan fue dado un libro por Maria

Postulating an empty preposition in the active form in (25):

(25) John gave Mary a book

leads us to conclude that the passive form in (24) is an instance of preposition stranding. Then the ungrammaticality of (24)(b) and (c) simply follows from the impossibility of preposition stranding in French and Spanish.

Kayne extends the analysis seen in (1) to preposition stranding in passives on the basis of the following assumptions: a Case-marked trace is identified as a variable. Following Siegel (1974), NP-mvt leaves Case behind on the trace; reanalysis follows inherent Case-assignment. Following these assumptions, in English, lacking inherent Case-assignment in VP, reanalysis will permit the passive, since no structural Case is assigned by the passive participle.

Chomsky (1981c, p.297) concludes that Kayne's analysis of preposition stranding and Exceptional-Case marking "thus shows how a single parameter of UG accounts for a variety of properties of the two language types, while providing further evidence for the projection principle, successive cyclic movement and several other principles".

Chomsky does point out that the proposed analysis of ECM raises a few problems and wonders whether an analysis assuming a 0-complementizer is really the correct one. But he concludes that "Kayne's approach to unifying preposition stranding and Exceptional-Case marking is, however, sufficiently attractive so that an attempt to resolve the remaining difficulties surely seems in order" (1981c, p.298). Thus the Govvernment and Binding (GB) Theory provides a sound analysis of these syntactic properties which may be subsumed under a parameter.

Parameter resetting perspective

Much of the grammatical theorizing done in second language research has focused on parameter resetting following the principles and parameters approach within Universal Grammar. Under this view, a certain number of parameters are set to the value of the first language being acquired. The question to be investigated in second language acquisition is the resetting of parameters when the value of the second language differs from the value of the native language.

a - The pro-drop parameter

The most studied parameter is the pro-drop or null subject parameter (Chomsky 1981c, Jaeggli 1982, Rizzi 1982) and the second language acquisition literature offers many examples of previous attempts to show evidence of parameter resetting (Phinney 1987, White 1985, 1986, Liceras 1986, Hilles 1986).

In general, it appears that that there was transfer of the L1 parameter setting, and sometimes, resetting to the L2 value. But as far as clustering is concerned, only some of the properties associated with the parameter were evidenced in second language acquisition.

However, as White (1989) points out, there is some disagreement as to what properties are actually subsumed under the pro-drop parameter. One version assumed by Chomsky (1981), Liceras (1988b), Phinney (1987), Rizzi (1982) and White (1985, 1986) claims that [+ pro-drop] languages such as Spanish and Italian exhibit the following properties:

- null subjects
- no pleonastic pronouns
- rich verbal agreement
- subject-verb inversion in declaratives
- that-trace sequences

Further [- pro-drop] languages such as English exhibit these properties:

- lexical subjects
- pleonastic pronouns
- lack of rich agreement
- no subject-verb inversion in declaratives
- no that-trace sequences

According to the version assumed by Hilles (1986) and Hyams (1986), [+ pro-drop] languages would have the following properties:

- null subjects
- no pleonastic pronouns
- auxiliaries and main verbs from one category

whereas [- pro-drop] languages would exhibit the following characteristics:

- lexical subjects
- pleonastic pronouns
- auxiliaries are distinct from main verbs

White (1989, p.85) argues that the main difference between the two versions is that the first version assumes that subject-verb inversion and that-trace sequences are part of the [+ pro-drop] value of the parameter whereas the second version does not. But Chao (1981), Safir (1982) and Hyams (1983) have also suggested that the Verb-Subject word order may not be part of the pro-drop parameter. This lack of consensus as to what properties cluster under the pro-drop parameter weakens its status as a putative parameter.

White (1985) tested the acquisition of the cluster of properties subsumed under the pro-drop parameter by native speakers of Spanish learning English as a second language. The results of a grammaticality judgment task reveal that the Spanish subjects accepted many ungrammatical English sentences as grammatical, whereas the French-speaking controls did not, and that the subjects' performance improved with increasing levels of proficiency. Referring to White (1985, 1986), White (1987c) concludes that "parametric variation offers a potential explanation of transfer errors with the native speakers of pro-drop languages transferring that parameter to the L2 so that L1 influence falls within a universals-oriented approach to the L2 acquisition" (White 1987c, p.240).

In the White (1986) study, the experimental group (32 native speakers of Spanish, 2 native speakers of Italian) and the control group (37 native speakers of French) performed a grammaticality judgment task and written question formation task. The first task tested three of the properties assumed to cluster with the first version of the parameter: null subjects, subject-verb inversion and that-trace effects. The results show that the Spanish speakers were more likely than the French subjects to accept the subjectless sentences. No difference was found for the other two properties. White suggests that this result may be explained by the choice of items which may have been inappropriate. However, it must be concluded that the properties did not cluster in the interlanguage of the subjects tested.

Phinney (1987), who also assumed the first version of the pro-drop parameter, looked at two properties--subject pronouns and the agreement system--in Spanish native speakers learning English (ESL group) and English native speakers learning Spanish (SSL). The results of written production data (i.e. free compositions) show that the two language groups differ as far as evidence for parameter resetting is concerned. Verbal agreement was quite accurate in all groups and the ESL groups did omit many more pleonastic pronouns than referential pronouns. In contrast, SSL groups correctly omitted referential as well as pleonastic pronoun subjects in Spanish and did not attempt to use a lexical pronoun as subject of impersonal constructions which suggests that they were successful in resetting the parameter to the target language value.

Hilles (1986), who adopted the second version of the parameter, used production data from a 12-year old native speaker of Spanish learning English as a second language. It was found that pronoun omission declined over the period of the study (10 months) in parallel with the emergence of auxiliary verbs as a distinct category. This suggests that the parameter was being reset to the L2 value. However, some caution is in order since this result is based on a single case study. More research is needed to determine whether this result can be replicated with a greater number of subjects.

Thus, the results obtained by White (1985, 1986), Phinney (1987) and Hilles (1986) show some evidence for transfer of the L1 parameter setting as well as resetting to the L2 value. However, only some of the properties subsumed under the pro-drop parameter appear to cluster in second language acquisition.

b - The Oblique-Case parameter

The present experimental study will investigate whether the proposed syntactic properties subsumed under what we may call the oblique-Case parameter, discussed above, do cluster and how they may be acquired. English would be [+ structural Case] since English prepositions can assign structural Case, whereas French and Spanish would be [- structural Case] since French and Spanish prepositions can only assign inherent Case.

The hypotheses to be tested are the following:

A - if the properties do cluster, the acquisition of any property will trigger the acquisition of the remaining properties.

B - the French properties and the Spanish properties will be acquired in the same way.

In A it is implied that if the properties do cluster, the acquisition of any property, irrespective of what that property may be, will trigger the acquisition of the other properties. So if for instance dative alternation is acquired first, it will then trigger the acquisition of dative passive alternation, dative passive and Exceptional-Case marking. Hypothesis A also contains the assumption that the acquisition of the first property will take place based on positive evidence alone. The acquisition of any one property should trigger the acquisition of the other properties even in the absence of positive or negative evidence.

Hypothesis B is based on the crosslinguistic similarity of French and Spanish. The experiment will test whether English learners of French and English learners of Spanish acquire the same properties as a cluster and following the same acquisitional sequence.

We have thus introduced the parameter resetting perspective and its predictions. Chapter 3 will review the relevant second language acquisition literature and introduce the second perspective adopted in this experimental study: the learnability perspective and its predictions as far as the acquisition of the proposed cluster of syntactic properties.

CHAPTER 3
REVIEW OF THE SECOND LANGUAGE ACQUISITION LITERATURE

Lightbown and White (1987, p.501) stress the fact that "until very recently, little attempt was made to relate research on learner language to specific hypotheses within a linguistic theory. In the 1980s there has been a considerable revival of interest in Chomskyan linguistic theory as a source of hypotheses about second language acquisition," of which the following studies are examples. In other words, we are testing the relevance of Universal Grammar (UG) to second language acquisition. UG consists of principles and parameters guiding first language acquisition. However, these principles and parameters are constantly being refined. It is in this sense that we can say that the theory of second language acquisition depends on linguistic theory.

The following studies are relevant to the present experimental study in that all of them tested one or more of the four syntactic properties which may be subsumed under a parameter. Mazurkewich (1984a), Le Compagnon (1984), White (1987a), Hawkins (1987) and Tanaka (1987) looked at the acquisition of dative alternation in English as a second language, while in White (1987b) the target language was French. Mazurkewich (1985b) looked at the acquisition of English dative passive by Inuktitut and French native speakers. White (1987b), Birdsong et al. (1984), van Buren and Sharwood Smith (1985) and Bardovi-Harlig (1988) investigated the acquisition of preposition stranding. Sheppard (1991) is--to the best of my knowledge--the only study which investigated the acquisition of Exceptional-Case marking by both English and French native speakers.

Mazurkewich (1984a). The Acquisition of the Dative Alternation by Second Language Learners and Linguistic Theory

Mazurkewich (1984a), using a test that elicited intuitive judgments, found that French-speaking and Inuktitut-speaking students learning English acquired the unmarked dative prepositional phrase complements before the marked double-NP complements. The type 1 sentences were generally judged to be grammatical by all subjects, whereas Type 2 sentences shows only an increasing judgment of acceptability across the three levels in the Inuit groups and the French groups show less systematic acquisition of that structure compared to the Inuit groups.

Type 1:

(26) a. Peter threw a football to Philip

b. Diane baked a cake for Nicole

Type 2:

(27) a. Peter threw Philip a football

b. Diane baked Nicole a cake

It is argued that this acquisitional sequence supports the theory of markedness which claims that unmarked structures, which are part of core grammar, are acquired before marked structures, which are peripheral rules of the core grammar. However, that claim is disputed by Kellerman (1985), who suggests a number of weaknesses in Mazurkewich (1984a) regarding (a) the examples chosen to illustrate dative alternation, (b) the choice of subjects in the experiment and the elicitation format used, and especially (c) the presentation and statistical treatment of the data.

White (1985) remarks that the Inuit subjects at all levels consistently produced a higher percentage of marked constructions than unmarked constructions, which seems to be inconsistent with Mazurkewich's claim that the unmarked forms precede the marked forms developmentally. White (1985, p.315) argues that "learners who have already been made aware of the possibility of marked constructions in L1 may also assume that they occur in L2." This may not necessarily be the case for all learners or for all marked properties. Learners may assume that L1 marked constructions are not allowed in the L2.

Mazurkewich (1985a). Syntactic Markedness and Language Acquisition

Mazurkewich (1985a) focused on the acquisition of passive dative structures by adolescents and young adults who were native French- and native Inuktitut-speaking students. Data were elicited on the acquisition of dative structures in a passive context using stimulus sentences containing to- and for-dative verbs:

(28) a. A football was thrown to Philip

b. A cake was baked for Nicole

(29) a. Philip was thrown a football

b. Nicole was baked a cake

Data were also elicited using nonalternating dative verbs which allow only passivized direct objects:

(30) a. A trip was suggested to Ruth

b. A house was designed for Claire

In general, the results indicate that passive structures in which the direct object is passivized are acquired before passive structures in which the indirect object is passivized. The same groups of subjects were used to elicit data testing the acquisition of dative questions in a passive context. Once again, the results show that the unmarked question forms are acquired before the marked ones. It is argued that the results support the predictions made by the theory of markedness as outlined in that study.

In a study testing French learners of English as a second language, Bardovi-Harlig (1988) also takes issue with the results of the Mazurkewich (1984b) study, arguing that the Inuktitut speakers'acquisition of preposition stranding over pied piping does not support Mazurkewich's claim since in contrast to the French speakers, the Inuktitut speakers produced more preposition stranding forms than pied piping forms in early stages. Furthermore, the possible transfer of pied piping by French speakers is dismissed based on two very marginal instances of what Mazurkewich claims to be preposition stranding in Canadian French, which goes against Vinet's (1979) analysis of these examples:

(31) Le boss que je travaille pour

'The boss that I work for'

(32) Le gars que j'ai sorti avec

'The guy that I went out with'

Vinet (1979) maintains that these structures in Quebec French are not the result of preposition stranding, but of the fact that these prepositions are intransitive. These constructions are not only stylistically marked but restricted to 'avec' and 'pour'; 'sans' and 'après' are also possible but much less common. Furthermore, according to Vinet, these structures cannot occur in questions (Vinet 1979, p.111):

(33) a. *Qui sors-tu avec?

b. *Qui tu sors avec?

'Who are you going out with?'

According to Vinet, the ungrammaticality of these interrogative structures supports the intransitive preposition analysis: prepositions cannot be stranded in French as a result of Wh-movement.

Bardovi-Harlig (1988) found that the putatively marked form, preposition stranding, was acquired before the unmarked form, pied piping, in both wh-question and relative clauses. It is suggested that this apparent counter-example to the markedness hypothesis could be explained by positing a second factor, salience, which would play a role in determining the acquisition order. Bardovi-Harlig defined salience in terms of availability of data: preposition stranding is more salient than pied piping, being used more frequently, and therefore standing out more prominently in the L2 input directed to the learners. However, as suggested by Birdsong (1992, personal communication), it could also be argued that pied piping is more salient that preposition stranding. Since pied piping is used less frequently that preposition stranding, its rare occurrence may be more noticed, i.e. more salient.

Le Compagnon (1984). Interference and Overgeneration in Second Language Learning: the Acquisition of English Dative Verbs by Native Speakers of French

Le Compagnon (1984) studied the relationship between full noun and pronominal indirect objects in dative alternation. She elicited spontaneous production data in a longitudinal study of two French adult native speakers, and a grammaticality judgment task with four subjects. The results of the longitudinal study show that all dative constructions where the indirect object was a pronoun were of the form [NP NP], and all dative constructions where the indirect object was a lexical NP, were of the form [NP PP]. For the grammaticality judgment task, Le Compagnon replicated the study by Mazurkewich (1981), but she first presented subjects with sentences with full dative NPs, and a week later, with the same sentences where the full NPs had been replaced by pronouns.

Le Compagnon claims that her results tend to contradict the results obtained by Mazurkewich (1984a), according to which dative prepositional phrase complements would be acquired before double-NP complements: "If this were in fact the case, then native speakers of French should not have allowed only cliticized indirect object pronouns with English to-datives since such a theory predicts that they would have previously learned the to + pronoun form" (Le Compagnon 1984, p.56).

Based on her results, Le Compagnon argues that the acquisition process for English dative verbs is essentially identical for second language learners, and attributes the errors made to false assumptions concerning both marked and unmarked forms in English for which there is positive evidence in the L1 and L2. This study does not provide any comparison data between pied piping and preposition stranding.

Hawkins (1987). Markedness and the Acquisition of the English Dative Alternation by L2 Learners

Hawkins (1987) investigated the acquisition of the English dative alternation across a wider range of verbs than those considered by Mazurkewich (1984a, 1984b, 1985) to include 36 verbs (alternating and non-alternating verbs, as well as to-

and for-verbs) with a group of 10 French native speakers by eliciting a grammaticality judgment task and a sentence construction task. Hawkins' results are very similar to those of Mazurkewich, showing very clearly that the [NP PP] structures are acquired before the [NP NP] structures for both to- and for-verbs; the acquisition of the dative double object construction with to-verbs preceding the acquisition of the double object construction with for-verbs.

Hawkins adapted Le Compagnon's results to include reference to the distribution of to-and for-verbs: two Ss accepted hardly any lexical NPs in the [NP NP] construction, whereas two others accepted lexical NPs in the double object construction but only with to-verbs. The same two Ss accepted almost all dative sentences with pronominal PPs, while the other two accepted them only with for-verbs. So it would appear that two Ss were making judgments based on the interaction of the distinction between lexical and pronominal dative NPs with the distinction between to- and for-verbs, whereas the other two made judgments only on the basis of the distinction between lexical and pronominal NPs.

Then, combining his results with Le Compagnon's (1984), Hawkins suggests a three step sequence of acquisition for French learners of the English dative alternation: the learners would acquire the English dative alternation "by the progressive introduction of syntactic features into their grammars. Learners begin with a broad distinction between pronominal and lexical datives [...], which is later refined by the introduction of a distinction between _to_- and _for_-verbs [...], and later still is refined by the introduction of the distinction between native and nonnative verb forms" (Hawkins 1987, p.46).

Hawkins claims that learners are guided by the one-to-one principle: learners assume, until positive evidence to the contrary, that each surface structure corresponds to a single underlying representation. In other words, learners assume that one of the surface constructions is initially prototypically pronominal and the other prototypically involves lexical NPs. This may be explained by transfer from the subjects' L1.

Hawkins invokes learnability constraints to explain the progressive acquisition of the dative alternation: it is presumably easier to test out one feature at a time when learning a new construction than to try out the whole set of features. Hawkins argues that the process of hypothesis testing is refined on the basis of positive evidence, and that the learning complexity would define markedness in the dative alternation. This analysis does not imply that UG is irrelevant in SLA, but takes issue with the particular version of UG proposed to account for the acquisition of the English dative alternation in studies like those of Mazurkewich (1984a, 1984b, 1985).

Tanaka (1987). The Selective Use of Specific Exemplars in Second Language Performance: The Case of the Dative Alternation

This study looked at the selective use of give in the two structures [NP NP] and [NP PP] in a translation task and a judgment task by 266 Japanese college students within a framework of transfer and markedness. The subjects were divided into three English proficiency groups, high, intermediate and low, based on their score of the cloze test administered beforehand. The translation test had the following three Japanese sentences typed on separate cards:

a - John wa sono shonen ni bike-o ataeta
    [John] [the boy] [to] [a bike] [gave]
b - John wa sono shonen ni punch-o ataeta
    [John] [the boy] [to] [a punch] [gave]
c - John wa sono shonen ni chance-o ataeta
    [John] [the boy] [to] [a chance] [gave]

The judgment task consisted of six categories with three items per category:

Category A:

1.a - John gave the book to a boy
  b - John gave a boy the book
2.a - Dr. Fox gave the comic books to boys
  b - Dr. Fox gave boys the comic books
3.a - Jerry gave the expensive pen to a girl
  b - Jerry gave a girl the expensive pen

Category B:

1.a - Harris gave a look at the document to Sharon

b - Harris gave Sharon a look at the document

2.a - Joel gave a turn to kick at the goal to Tom

b - Joel gave Tom a turn to kick at the goal

3.a - James gave a punch in the eye to Cathy

b - James gave Cathy a punch in the eye

Category C:

1.a - George gave a headache to Rose

b - George gave Rose a headache

2.a - Jimmy gave a party to Lucy

b - Jimmy gave Lucy a party

3.a - Alice gave a kiss to Clifford

b - Alice gave Clifford a kiss

Category D:

1.a - Overwork gave a heart attack to Bill

b - Overwork gave Bill a heart attack

2.a - Worry gave a nervous breakdown to Martha

b - Worry gave Martha a nervous breakdown

3.a - Her blonde hair gave a good appearance to Jane

b - Her blonde hair gave Jane a good appearance

Category E:

1.a - Thomas gave a kick to the ball

b - Thomas gave the ball a kick

2.a - Paul gave a pinch to her arm

b - Paul gave her arm a pinch

3.a - Gibson gave a pull to the rope
b - Gibson gave the rope a pull

Category F:

1.a - Sharon gave a bike to the small boy
b - Sharon gave the small boy a bike
2.a - Iris gave some flowers to the girl
b - Iris gave the girl some flowers
3.a - Harris gave a toy to the baby
b - Harris gave the baby a toy

The results of the translation task showed that the students used both structures with equal frequency when dealing with prototypical cases of dative give, while the [NP PP] was strongly preferred with cases deviating from the prototype. The judgment task was designed to investigate three different constraints: discourse, semantic and perceptual. The results indicate that the subjects were more sensitive to the perceptual than to the discourse constraint, which, according to Tanaka (1987, p.83) suggests a theory based on scalar markedness (Zobl 1983). Tanaka also claims that language learners may perceive some items as more marked than others, and points out that the degrees of markedness as perceived by the language learners are an important consideration (Le Compagnon 1984). In addition, these degrees of markedness as perceived by the language learners may differ from the degrees of markedness as assigned by linguists.

White (1987b). Markedness and Second Language Acquisition: The Question of Transfer

In White (1987b), English native speakers, adult and child learners of French as a second language, were tested using grammaticality judgment tasks on preposition stranding and double object structures. Both structures are considered to be marked. It was found that only the double object structures were accepted in French. Preposition stranding was not transferred to the L2. White concludes that neither the hypothesis that marked structures in the L1 will be a source of transfer errors in the L2, nor the developmental hypothesis which claims that all L2 learners will adopt the unmarked case initially, are supported. However, White cites a number of other studies where evidence of transfer of preposition stranding was found, such as Harley (cited as personal communication in White 1987b). Selinker, Swain, and Dumas (1975) report a number of production errors from English children in French immersion programmes:

(1) Un chalet qu'on va aller à (p.146)

Liceras (1983), in a study of adult native speakers of English learning Spanish, found that half of the beginner subjects accepted preposition stranding; Tarallo and Myhill (1983), studying the acquisition of relative clauses by native speakers of English learning various languages, found that preposition stranding was accepted in certain cases, especially by those learning German, Chinese and Japanese.

Ungrammatical relative clauses with stranding were judged grammatical by native speakers of English learning various languages where preposition stranding is not possible. Portuguese, for example, allows only pied piping:

(36) O homem com que eu falei era americano

The man with whom I spoke was American

(37) * O homem que eu falei com era americano

The man that I spoke with was American

White suggests that prior knowledge is involved in SLA, "so that data having triggered a marked form in another language known to the learner may obscure the correct analysis of the L2 data" (p.278). It is not clear why one marked structure was transferred and not the other.

Liceras (1983) also found that native speakers of English learning Spanish as a second language at the beginner's level judged preposition stranding to be possible in Spanish, while students at the intermediate and advanced level did not. In addition, in an experiment involving grammaticality judgments by native speakers of English learning French as a second language (White 1983), ungrammatical French sentences with the marked double-object construction (which is found in English but not in French) were judged to be grammatical both by the experimental group and by a control group which consisted of native speakers of various languages, all of whom knew English.

This suggests that the presence of a marked construction in L1 or some other language that one already knows is indeed a source of interference in that the subjects did transfer the L1 property into the L2. This contradicts the developmental hypothesis of markedness and supports the transfer hypothesis as stated in White (1987b, p.266). The developmental hypothesis predicts that "learners will acquire unmarked forms as a necessary developmental stage before the acquisition of marked forms. The L2 learner will not initially hypothesize marked forms in the interlanguage, even where the L2 requires marked forms, and marked forms will not be transferred from the L1" (p.266). White reports that it has been argued that second language learners are less likely to transfer marked forms than unmarked forms (Adjémian and Liceras 1984, Hyltenstam 1984, Kellerman 1983, Liceras 1983, Rutherford 1982). Her results partially support the claim that L1 marked forms may be transferred into the L2, although it remains unclear as to what syntactic structures may be transferred and whether such a transfer would depend on formal or psycholinguistic markedness. A formal definition of markedness identifies marked structures as the structures selected based on direct or indirect evidence. The unmarked options are selected as such in the absence of evidence to the contrary. A psycholinguistic definition of markedness suggests that adult speakers know what structures are marked in their L1, and that they will avoid transferring them into the L2.

Birdsong et al. (1984). Universals versus Transfer Revisited

Birdsong et al. (1984), focusing on native speakers of English learning French as a second language, compared judgment data from a nominal grammaticality task with data from rank-ordering tasks. Using relative clauses, four types of deviances were tested: resumptive pronouns, preposition stranding, resumptive pronoun + preposition stranding, preposition stranding + relativizer deletion. These four types of sentences are ungrammatical in French.

(a) Resumptive

a. * Il a cassé les lunettes dont il EN a besoin

b. * He broke the glasses which he needs THEM

(b) Stranding

a. * Il a cassé les lunettes qu'il lit AVEC

b. He broke the glasses that he reads with

(c) Resumptive + Stranding

a. * Il a cassé les lunettes qu'il lit AVEC ELLES

b. * He broke the glasses that he reads with THEM

(d) Stranding + Deletion of relativizer

a. * Il a cassé les lunettes / il lit AVEC

In the first task, it was found that resumptive pronoun structures are accepted with significantly more frequency than preposition stranding. So it seems that not only subjects did not transfer their NL rules, but they appear to accept more often a rule which exists in neither the L1 or the L2. In the second task, it appeared once again that subjects favored the IL universal rule of resumptive pronouns to transfer rules of preposition stranding and preposition stranding + deletion.

Van Buren and Sharwood Smith (1985). The Acquisition of Preposition Stranding by Second Language Learners and Parametric Variation

Forty-three university students in their second or third year of English study at the University of Utrecht, and eighty five school children who have had one year of English were tested. In a second round of testing, forty six more second-year students were given one of the tests administered to the first round school children. In the first round, the univer-sity students were presented with a Story Test task which contextualized the target sentences in short stories of a few lines, and a Deaf Man task which asked subjects to judge the responses of a deaf man who had not understand what he had been told. Both tasks required subjects to accept or reject English sentences with prepositions that were both correctly and incorrectly stranded. Examples are given in (a) and (b):

(a) A(ccept) R(eject) 1) The room was still

A R 2) The inspector asked Mary a few questions

A R 3) Where had she gone to ?

(b) JILL	DEAF MAN
He immediately arrived at the right solution	WHICH SOLUTION DID HE IMMEDIATELY ARRIVE AT ? A R

(van Buren and Sharwood Smith 1985, p.32)

Preliminary results of the university tests show a significant difference between the two tasks administered to the subjects with the Deaf Man task proving to be difficult for the majority of subjects. In the Story Test there were many more wrong rejections than wrong acceptances. This may in fact reflect a bias toward rejection.

School children were administered three subtests. The first subtest asked subjects to form sentences with prepositions by choosing words from a pool; the second subtest was a grammaticality judgment task involving preposition stranding and pied-piping; the general result showed a marked preference for pied-piping (60%); the last subtest was an alternative acceptability judgment task where subjects indicated stranding or pied-piping possibilities by rearranging sentences in which the preposition was unplaced. The overall tendency was also in favor of pied-piping.

It is concluded that "the overwhelming presence of stranding in the input is not reflected in either the school beginners or the advanced university subjects' behavior and that there are individual differences which suggest that learners may have some freedom as to which of the three strategies hypothesized by us they might choose, that is, pied-piping, radical (i.e. 'promiscuous') stranding including R-pronoun and crosslinguistic stranding (i.e. predominantly R-pronouns rather than non-R-pronouns)."

Sheppard (1991). At Sea in SLA: Evidence of UG in the Acquisition of French and English Verbs

In this study 48 native French speakers and 48 native English speakers were asked to rate the acceptability of a randomized list of 50 items on a scale from 1 to 3 (1 = totally unacceptable, 2 = uncertainty, 3 = totally acceptable). Sheppard was essentially interested in three verb types--believe/croire, promise/promettre, want/vouloir--in three syntactic environments--fully tensed clausal complements, Exceptional-Case marking and control structures. The following examples illustrate the grammatical and ungrammatical exemplars used in the study:

(a) *je crois Jean être. . .   I believe John to be
(b) *je veux Jean être à l'heure   I want John to be on time
(c) je crois Jean intelligent   *I believe John intelligent
(d) je veux que Jean soit. . .   *I want that John is. . .
(e) je promets que je serai. . .   I promise that I will. .
(Sheppard 1991, p.88)

This study examined four overlapping hypotheses dealing with markedness, UG and transfer. Some support was found for the second hypothesis which looked into the "possibility of an underlying similarity in assumptions about the grammar of the L2" (Sheppard 1991, p.iv). Ambiguous support was found for the remaining hypotheses which attempted to (1) make predictions based on markedness differences based on the two languages, French and English, (2) establish a putative preference for the French setting of the parameter, and (3) confirm an alleged predisposition for L1 transfer.

Sheppard argued that both his groups were relatively successful in the acquisition of the proposed parameters noting that the only exceptions were the failure of the Francophone group to acquire believe + ECM and the failure of the Anglophone group to successfully acquire croire + PRO. Sheppard concluded that the Anglophone group transferred 36% of the items with croire + ECM, and 24% of the items with vouloir + ECM. In other words, the subjects tested were successful 64% and 76% each time, respectively.

So from this review of the existing literature, it may be concluded that the evidence concerning the acquisition of preposition stranding, Exceptional-case marking, dative alternation and dative passive by English adult learners of French or Spanish remains contradictory and inconclusive. The only consensus seems to be that the double object dative structures are acquired before the prepositional dative structures (Hawkins 1987, Mazukewich 1984a, Le Compagnon 1984)--but [NP NP] structures were acquired first when pronominal constructions were used instead of full noun constructions.

White (1987b) found that English native speakers learning French as a second language transferred the double object dative structure into the target language. However, as far as preposition stranding is concerned, some studies (Bardovi-Harlig 1988, Birdsong et al. 1984, White 1987b) found that preposition stranding was not transferred into the second language (French or English), whereas other studies (Tarallo and Myhill 1983, Selinker et al. 1975) found evidence of transfer.

These studies were designed within a framework of markedness or/and transfer. The present study is situated within two broader perspectives, a learnability perspective and a parameter setting perspective, which do include the concept of markedness and transfer, as will be discussed below.

Learnability Perspective

Learnability theory investigates the cognitive principles that may determine developmental stages and the ultimate success attained in language acquisition. In other words, learnability theory addresses the developmental problem and the logical problem of language acquisition. Cognitive approaches to learnability in first language acquisition literature have resulted in many proposals such as the Subset Principle (Berwick 1985, Berwick and Weinberg 1984), the Uniqueness Principle (Pinker 1984, 1986), the Principle of Contrast (Clark 1987), the Competition Model (MacWhinney 1987), the Semantic Bootstrapping Hypothesis (Pinker 1987), and the Lexical Approach (Roeper, La Pointe, Bing and Tavakolian 1981). Cognitive approaches to learnability are limited to recent work, e.g. White 1987d, Zobl 1988. With the exception of Wolfe Quintero (1992) who studies three other learning principles--cumulative development, continuity and conservatism--the only principles to have been investigated are the Subset Principle, preemptibility and uniqueness. However, the Wolfe Quintero study is placed within a learnability perspective following the O'Grady (1987) framework which differs from the Universal Grammar framework adopted here.

The learning principle to be investigated here is the Subset Principle and the predictions that can be made based on a superset/subset relation. When placed in a situation where the L1 is the superset and the L2 is the subset, it is predicted that learners will initially continue to use the L1 setting of the parameter until they realize that the L2 actually only allows a subset of the L1 properties. In other words, learners may transfer the L1 property into the L2 and create a superset grammar, or they may be able to constrain their grammar and end up with the proper L2 subset. If second language learners are guided by a learning principle such as the Subset Principle, they may proceed based on the positive evidence available to them which would yield the proper grammar. So the hypothesis to be investigated within a learnability perspective is the following:

- the acquisitional sequence of the syntactic properties will show that second language learners follow the Subset Principle.

Let us recall that the hypotheses to be investigated within the parameter resetting perspective were:

A - if the properties do cluster, the acquisition of any property will trigger the acquisition of the remaining properties.

B - French and Spanish properties will be acquired in the same way.

Thus the learnability perspective and the parameter resetting perspective make competing and similar predictions. First, both approaches predict that the acquisition of the cluster of syntactic properties will take place based on positive evidence alone.

a - Within a parameter resetting perspective we assume that it is the positive evidence present in the input that will trigger the acquisition of the properties subsumed under the Oblique-Case parameter. The acquisition of any property will trigger the acquisition of the remaining properties. Furthermore, once a property has been acquired, the acquisition of the other properties should follow whether there is any kind of evidence available, positive or negative.

b - Within a learnability perspective, it is claimed that the learners should entertain the smallest hypothesis compatible with the positive evidence available to them in the input.

This would lead the learners to assume that French or Spanish:

- allow only prepositional structures for dative alternation
- do not allow the stranding of preposition at the end of declarative or interrogative sentences
- require an animate subject for passive dative sentences
- limit instances of Exceptional-Case marking to specific verbs.

In other words, if the process of acquisition of the L2 learners of French and Spanish is based on positive evidence alone, these learners should not transfer L1 structures which are not allowed into the target language.

However, the parameter resetting approach predicts that the properties will be acquired simultaneously as a cluster, whereas the learnability perspective breaks up that cluster by predicting that the properties will be acquired individually in a particular order, based on the positive evidence available to them. That particular order of acquisition may depend on a markedness hierarchy as will be discussed below.

The parameter resetting perspective and the learnability perspective include the concepts of markedness and transfer in an interesting way. There are several definitions of mark-edness. A formal definition of markedness used in work on language learnability within the framework of generative gram-mar identifies marked structures as "added on the basis of direct or indirect evidence, while certain options are selected as unmarked in the absence of evidence to the contrary by the person acquiring knowledge of the grammar" (Chomsky, 1981c, p.137). An implicational approach to markedness is based in language typology (Eckman 1977, 1984, 1985; Hyltenstam 1984) which assumes that in a pair of structures, the marked structure implies the unmarked structure but the unmarked structure does not imply the marked one. For instance, preposition stranding which is marked implies pied piping, its unmarked counterpart, but the opposite cannot be true. Finally, Kellerman (1983) argues for psycholinguistic markedness, proposing that adult speakers know what structures are marked in their native language, and that they will avoid transferring such marked structures. A psychological approach to markedness may be intuitively appealing but it is not defined independently, whereas the learnability and implicational views of markedness make use of independent criteria.

Let us recall that the parameter resetting and the learnability perspectives adopted here make a similar prediction: the acquisition of the cluster of properties will take place based on positive evidence alone. The parameter resetting perspective predicts that the acquisition of any property, marked or unmarked, will trigger the acquisition of the remaining properties. In contrast, a learnability perspective predicts that the learners should acquire the unmarked properties first since they would constitute the smallest hypothesis compatible with the data (French and Spanish exhibit the unmarked counterpart of the structures tested here). The role that markedness may play depends on whether or not one assumes that the second language learners are able to ignore their native language to focus on the target language. Ideally, learners should not transfer their marked or unmarked structures into the L2 and should acquire the L2 structures, marked or unmarked, based on the positive evidence available to them. Within a parameter resetting framework, a markedness scale is irrelevant, whereas, within a learnability framework, a markedness scale should determine the acquisitional order.

Chapter 4 restates the hypotheses and predictions made within both the parameter resetting perspective and the learnability perspective, and describes the experimental study which consists in a grammaticality judgment task and a correction task.

CHAPTER 4
THE EXPERIMENTAL STUDY

The purpose of this experimental study was to investigate the acquisition of a cluster of syntactic properties -- preposition stranding, dative alternation, dative passive and Exceptional-Case marking -- from a parameter resetting perspective and a learnability perspective, in an attempt to provide an insight into the process of second language acquisition. Let us recall that the hypotheses to be investigated within these two perspectives make similar and competing predictions. Both perspectives predict that the acquisition of the cluster of syntactic properties will take place based on positive evidence alone. However, the parameter resetting approach predicts that the properties will be acquired simultaneously as a cluster, whereas the learnability perspective breaks up that cluster by predicting that the properties will be acquired individually in a particular order, based on the positive evidence available to them.

The main question to be answered within a parameter resetting perspective is whether the properties do cluster and if the acquisition of any property will trigger the acquisition of the remaining properties. In contrast, the question to be answered within a learnability perspective is whether second language learners observe a learning principle such as the Subset Principle.

Subjects

Forty five learners of French and forty five learners of Spanish enrolled in language classes at the University of Florida voluntarily participated in the experiment. The learners of each language were divided into three proficiency levels (n=15) based on the class they were enrolled in at the time of the experiment, and constituted the experimental groups.

Subjects in the first proficiency level (Intermediate I) were in their second year of study and were enrolled in F2200 or S2200. Intermediate II subjects were in their third year of study (F3300 or S3300). Subjects in the Advanced group were in their fourth year of study (F4000 or S4000).

No pre-test screening was conducted, but all participants were required to fill out a background data sheet to ensure as much intra-group homogeneity as possible. Subjects who did not meet the general profile were excluded from the analysis of the results. This decision was based mostly on their language background (See Appendix E).

In addition to the three experimental groups in each language, a group of French native speakers (n=15) and a group of Spanish native speakers (n=15) participated in the experiment and were used as control groups. All were college educated.

Population attributes

Sex: The majority of the population was female (76% of the non native subjects and 67% of the native subjects).

Age: The average age for the non native speakers was 20.6 (ranging from 17 to 35), and the average age for the native speakers was 26.9 (ranging from 18 to 42).

Knowledge of additional languages: Only 21% of the non native subjects indicated that they knew an additional language (besides the language tested in the study) at various levels of proficiency from beginning to advanced, whereas 87% of the native speakers reported knowing a third language at a level of proficiency ranging from intermediate to advanced (See Appendix E).

Methodology

Test condition

The test was administered by the researcher over a three week period in a computer language learning center at the University of Florida. Subjects participated in the experiment on a voluntary basis and whenever it was convenient to them.

They were asked to fill out a confidential background information sheet and were free to withhold personal data and to withdraw their consent at any time during the experiment. None did so. They were given written instructions and the researcher was available to answer any additional questions subjects had. The same instructions also appeared on the computer screen to make sure subjects understood and were familiar with the instructions before starting the experiment. The subjects tested took an average of 20 minutes to fill out the background data questionnaire (see Appendix D) and complete both tasks.

Instruments

After subjects had filled out the background data sheet, they were instructed to perform two tasks on an IBM personal computer.

Task 1: Grammaticality judgment task

The software was written in Turbo Pascal and was designed to execute the following: at the C> prompt, the subject typed 'RUN' and the program randomized the stimuli, so that the test items were presented in a different order for each subject. 'Usercode' would prompt the subjects to enter their last name. This was done to be able to later establish any eventual correlations between subjects' performance on both tasks and subjects' background data. Confidentiality was ensured by numbering the subjects. Then, instructions appeared on the screen informing the subjects that they were going to be presented with one sentence at a time and that they would be asked to rate its acceptability/grammaticality from a scale of 1 to 4 (1 = completely unacceptable, 2 = unacceptable, 3 = acceptable, 4 = completely acceptable) by pressing the desired key on the computer key board. The scale was kept at the bottom of the screen during the whole task as a reminder. Subjects were also instructed not to 'think too hard', to rely on their first judgment and to perform the task quickly (see Appendix H). However, they were not told that they were being timed. As soon as a key (1 to 4) was pressed, the next sentence would appear on the screen. Subjects did not have the possibility to go back and change their answers.

Although there are no theory-based predictions on timing, timing was included in an attempt to find out if students would take significantly longer to correctly reject ungrammatical sentences or to correctly accept grammatical sentences.

Subjects were told that there were no mistakes of spelling, accent, agreement, word choice or tense on conjugated verbs. This represented an attempt to prevent subjects from examining sentences for irrelevant elements.

A scale was used since it has been argued that the scaled judgments of grammaticality are more informative and reliable than nominal data (Chaudron 1983). According to Birdsong (1991) the psychological validity of scalar grammaticality statements is supported by work by Barsalou (1987) and others in category theory. The category of well-formedness is susceptible to gradedness effects in experimental performance. Scalar responses would thus provide data that more accurately reflect subjects' intuitions.

Grammaticality judgments are a way of testing whether the L2 learners' competence includes knowledge of certain forms. However, grammaticality judgment tasks present a number of problems, such as response biases on the part of the subjects, who may also be judging sentences based on a semantic criterion instead of a syntactic criterion for example (Birdsong 1989, Kellerman 1985). A way of verifying that subjects are judging the intended syntactic phenomena is to ask them to correct the sentences they judged ungrammatical. This procedure is carried out in Task II.

Other sources of data for grammatical theory include "observation and recording of spontaneous speech, open-ended and directed interviews, monitoring of spontaneous responses to sentences under investigation, and imitation (Eubank, in press; Flynn 1987b), comprehension (Flynn 1986), compositions (Jordens 1986, Phinney 1987) and manipulation of test sentences [...] the prevailing data base, however, is judgments of acceptability or grammaticality" (Birdsong 1989, p.72).

So in spite of the fact that the use of grammaticality judgments is crippled with problems of validity, reliability and generalizability (Birdsong 1989, p.80), it is the most widely used in second language acquisition experimental research, as investigation develops more reliable means of testing learners' linguistic competence.

Task II: Correction task

The purpose of the correction task was to verify that subjects had applied the relevant syntactic criterion when rejecting ungrammatical sentences. As subjects were performing the first task, the program was saving in a subfile all the sentences rated 1 or 2 (i.e. two levels of unacceptability) by each subject. Upon completion of the grammaticality judgment task, instructions appeared on the screen informing the subjects that they were going to be presented with unacceptable sentences. They were asked to rewrite them the way they thought they should be (see Appendix H). They were not told that they were being asked to correct their 'own' sentences, i.e the sentences they had rejected as unacceptable. Since the stimuli were randomized for each subject, the order in which the sentences appeared for the correction task was also different for each individual.

Stimuli

The stimuli consisted of 50 sentences which were instances of preposition stranding, Exceptional-Case marking, dative alternation and dative passive (see Appendix G). As mentioned above, the sentences were automatically randomized by the program for each subject. The French and Spanish data included 25 grammatical and 25 ungrammatical sentences. All the equivalent English sentences were grammatical.

a - Preposition stranding: 10 grammatical sentences with pied piping, 5 declaratives and 5 wh-interrogatives, 10 ungrammatical sentences with preposition stranding, 5 declaratives and 5 wh-interrogatives. These are exemplified below.

- Preposition stranding: wh-interrogatives

(1) a. * Qui Jean donne t-il le livre à?

b. * ¿Quién da Juan el libro a?

'Who does John give the book to?'

(2) a. A qui Jean donne-t-il le livre?

b. ¿A quién le da Juan el libro?

'To who(m) does John give the book?'

- Preposition stranding: declaratives

(3) a. * C'est la raquette que je joue avec

b. * Es la raqueta que juego con

'That's the racket (that) I play with'

(4) a. C'est le ballon avec lequel je joue

b. Es el balón con el cual juego

'That's the ball with which I play'

b - ECM : 5 grammatical , 5 ungrammatical.

(1) a. * Je crois Jean être en retard

b. * Creo Juan estar atrasado

'I believe John to be late'

(2) a. Je crois que le président a raison

b. Creo que el presidente tiene razón

'I believe that the president is right'

c - Dative alternation: 5 [NP PP], 5 [NP NP]

(1) a. Ils donnent des jouets aux enfants

b. Les dan juguetes a los niños

'They give toys to the children'

(2) a. * Ils donnent les enfants des jouets

c. * Dan los niños juguetes

'They give the children toys'

d - Dative passive: 5 ungrammatical, 5 grammatical.

(1) a. * L'enfant a été donné un jouet
 b. * El niño fue dado un juguete
 'The child was given a toy'

(2) a. Un message a été envoyé à Jean
 b. Un mensaje fue mandado a Juan
 'A message was sent to John'

The items were controlled for length, gender of lexical items, number of syllables, and simplicity of vocabulary. No distractors or dummy items were introduced because it was believed that the syntactic properties tested ensured sufficient variety.

Pilot study

A pilot study was conducted to detect any possible flaws in the design and/or the stimuli.

Subjects

Nineteen adult speakers of English enrolled in a proficiency-oriented program geared toward all four skills at the University of Florida served as subjects.

Group 1 : Beginning French - 5 Ss having completed their second year of study participated.

Group 2 : Advanced French - 5 Ss having completed their third year (1 S) or fourth year of study (4 Ss) participated.

Group 3 : Beginning Spanish - 4 Ss currently enrolled in their second year of study participated.

Group 4 : Advanced Spanish - 5 Ss having completed their third or fourth year of study participated.

Method

The first task was a grammaticality judgment task : Ss were instructed to read the sentences one at a time and to rate them on a scale from 1 to 5--1 and 2 (completely unacceptable), 3 (unsure), 4 and 5 (completely acceptable)--without going back to previous sentences in order to compare them. They were asked to proceed quickly and to indicate their ratings on an answer sheet. The second task was a correction task: the experimenter circled the sentences rejected by the subject (1 or 2) and asked the Ss to rewrite them the way they thought they should be without indicating whether the circled sentences were acceptable or not. The two tasks were administered on an individual basis.

Results

The 50 sentences were analyzed by category: - preposition stranding, Exceptional-Case marking, dative alternation and dative passive. The sentences were divided into three types: sentences which were correctly rejected (CR), sentences which were incorrectly rejected (UR) and sentences which Ss failed to reject (FR).

A - Grammaticality judgment task

The results indicated that most of the properties were successfully acquired by the learners. No significant difference was found between beginner and advanced learners.

B - Correction task

Proper corrections include items where the relevant correction was made whether the resulting sentence was correct or not. For example, the following sentence was counted as correct because the subject used pied piping even though the relative pronoun is wrong:

1 - c'est la raquette que je joue avec
c'est la raquette avec que je joue

The corrections provided for incorrectly rejected sentences show three patterns:

- in some cases, only minor changes irrelevant to the structure in question were made such as verb tense or pronoun.
- some corrections resulted in ungrammatical sentences, suggesting that the structure was not understood or simply that the subjects were unable to provide the proper correction.
- the structure was significantly altered, e.g. a passive sentence was turned into an active one, suggesting again that the structure might not have been understood or that the subjects had detected the ungrammaticality but lacked the metalinguistic sophistication to provide the relevant correction. Or it may simply be that they were more familiar with, and therefore favored, a specific structure over another structure such as an active structure versus a passive structure. The results of the correction task seem to indicate that advanced

learners were more successful at providing the appropriate correction.

The following modifications were made based on the results of the pilot study:

- the scale from 1 to 5 was changed to a scale from 1 to 4, eliminating 3=unsure, which had to be thrown out in the final analysis because "unsure" cannot reasonably be considered a mid point between ungrammaticality and grammaticality
- both tasks were computerized allowing to randomize the stimuli for each subject, test up to fifteen subjects at a time, allow subjects to proceed faster and eliminate the possibility of human error in saving the data
- the instructions were finessed by adding that there were no errors in spelling, agreement, word choice or tense on conjugated verbs
- a few vocabulary items were changed because some group 1 subjects indicated that they were not familiar with them.

Chapter 5 will restate the hypotheses and predictions made within the parameter resetting perspective and the learnability perspective, and report the results of the grammaticality judgment task and the correction task.

CHAPTER 5
RESULTS AND INTERPRETATIONS

Let us recall that the hypotheses to be investigated within the parameter resetting perspective were :

A - If the properties do cluster, the acquisition of any property will trigger the acquisition of the remaining properties

B - French and Spanish properties will be acquired in the same way

Two peripheral issues related to the parameter resetting approach will also be treated: the learners'level of proficiency and the timing of the grammaticality judgment task. First, although the literature offers no principled account, it is often implied that the performance of the subjects is expected to improve with their level of proficiency. Second, in spite of the fact that there are no theory-based predictions on timing, timing of the grammaticality judgment task was included in an attempt to establish a correlation between the amount of time taken by the subjects to perform the various tasks, and their performance on these tasks.

And the hypothesis to be investigated within a learnability perspective was the following:

- the acquisitional sequence of the syntactic properties will show that second language learners follow the Subset Principle.

Analyses

The analyses were performed on an IBM computer using SAS (Statistical Analysis Software). Various analyses of variance (ANOVA) were conducted with the derived data and the scalar data obtained from the grammaticality judgment (GJ) task. The derived data were obtained by sorting the raw data into grammatical sentences and ungrammatical sentences. Sentences were assigned 1 if they were correctly rated (i.e. rated 3 or 4) and 0 if they were incorrectly rated (i.e. rated 1 or 2). This value, 1 or 0, was used as the dependent variable. The scalar data are the raw data of the ratings (from 1, completely unacceptable to 4, completely acceptable) subjects assigned to the stimuli. The percentages for the derived data and the means for the scalar data are given in terms of correctly accepted and correctly rejected sentences. Derived data will be abbreviated to DD and scalar data to SD. The properties tested are referred to by the following acronyms:

DA = dative alternation
DP = dative passive
ECM = Exceptional-Case marking
PSI = preposition stranding, interrogative structures
PSD = preposition stranding, declarative structures

Results of the Grammaticality Judgment Task

Parameter resetting perspective

A - If the properties do cluster, the acquisition of any property will trigger the acquisition of the remaining properties

Overall results: French and Spanish groups

From a parameter resetting perspective the overall derived and scalar results of the grammaticality judgment task indicate that the hypothesis A cannot be accepted: the acquisition of a given property did not trigger the acquisition of the remaining properties since the five syntactic properties tested do not cluster. They fall into three highly significant REGWF (Ryan-Einot-Gabriel-Welsch Multiple F Test) groupings for correctly accepting grammatical sentences, and into four highly significant groupings for correctly rejecting ungrammatical sentences. The means with different letters (A, B, C, etc.) are significantly different. The overall percentages for correctly accepting grammatical sentences are:

DD - REGWF grouping	Properties	% Correctly ACC
A	DA	95%
B	DP	88%
B	PSI	86%
C	PSD	76%
C	ECM	75%

The overall means of raw data for correctly correctly accepting grammatical sentences are:

SD - REGWF Grouping	Mean	N	Properties
A	3.7870	568	DA
B	3.7129	519	PSI
C	3.6025	478	DP
C	3.5987	451	ECM
C	3.5646	457	PSD

The fact that, for example DA is placed in one grouping and DP in a different grouping, indicates that not only subjects performed differently for each of these properties but also that their performance for each group, A, B and C was significantly different. They performed significantly better on DA than on the remaining properties and their performance for DP and PSI was significantly better than for PSD and ECM. If the acquisition of, for example, preposition stranding, had triggered the acquisition of dative alternation, dative passive and Exceptional-Case marking, the results would have shown a single grouping, indicating that no significant difference was found between the syntactic properties. In that case it would have been concluded that subjects performed in a similar manner for all properties. That performance would have allowed us to claim that the subjects tested were at the same level of competence for all the properties tested. But the fact that significant differences were found between the properties indicates that the subjects are acquiring these properties one by one as opposed to as a cluster. These percentages indicate that all five properties were successfully acquired by the subjects tested since all percentages are above the decisive

68% ($p < .05$. See Appendix I) indicating that subjects performed better than chance.

Following the general trend in second language acquisition literature, we assume that a better than chance performance may be equated with the acquisition of the properties tested. Different criteria are used throughout the literature to establish a better than chance level. Wolfe Quintero (1992, p.57) states that "there were three test sentences for each type of extraction (two from Task 1; one from Task 2), and if subjects were able to produce the target response type at least two out of three times (67%), they were considered to have acquired that type. This criterion seems reasonable considering that subjects had only three chances to produce each type". Bley-Vroman, Felix and Ioup (1988) reporting that chance performance would have been only 25%, conclude that "nonnative performance was clearly not simply based on guessing" (p.32). Other studies, such as Broselow and Finer (1991) simply mention that the subjects performed at a "far greater than chance frequency" without specifying how such a conclusion was reached.

The overall percentages for correctly rejecting ungrammatical sentences are:

DD - REGWF Grouping	Properties	% Correctly REJ
A	PSI	96%
A	PSD	91%
B	ECM	80%
C	DA	64%
D	DP	49%

The overall means for correctly rejecting ungrammatical sentences are:

SD - REGWF Grouping	Mean	N	Properties
A	1.4583	384	DA
A	1.4108	297	DP
A	1.4017	483	ECM
B	1.2344	546	PSD
B	1.2336	578	PSI

We may conclude that there is only weak evidence for clustering and more so for correctly accepting than correctly rejecting sentences. Subjects performed better than chance for only three properties, obtaining only 64% for DA and 49% for DP, which is well below the percentage for better than chance. In addition, it is interesting to notice that, overall, subjects perform quite differently on the two instances of preposition stranding, declaratives (PSD) and interrogatives (PSI). A significant difference was found between PSI and PSD in correctly accepting (86% vs 76%), but no significant difference was found for correctly rejecting (96% vs 91%).

The scalar data indicate the relative degree of grammaticality the subjects attributed to the various sentences. For ungrammatical sentences, the more they perceived the sentences to be ungrammatical, the closer to 1 the means should be. For grammatical sentences, the closer to 4, the more the subjects perceived the sentences to be grammatical. It is interesting to notice that most of the properties tested fall within the same groupings for the scalar data as they do for the derived data. For example, the derived data indicate that the subjects correctly rejected 96% of the ungrammatical PSI sentences, and the scalar data show they attributed a high degree of ungrammaticality to these sentences since PSI has the mean closest to 1 (1.23).

To sum up, the acquisition of any property did not trigger the acquisition of the remaining properties. So it may be concluded that these overall results do not support parameter resetting in adult second language acquisition for the proposed instantiations of preposition stranding, Exceptional-Case marking, dative alternation and dative passive.

Results by groups

By taking a closer look at the results by groups we find somewhat stronger evidence in favor of the hypothesis within a parameter resetting perspective: the results of the ANOVA indicate only two groupings for correctly rejected sentences for F2200, F4000, S2200, S3300, S4000 and surprisingly also for SNS. FNS show only one grouping, as expected.

F2200 Internal ANOVA

DD - REGWF Grouping		% CORR ACC Mean	Property
	A	100%	DA
B	A	87%	DP
B	A	85%	ECM
B		79%	PSI
B		72%	PSD

SD - REGWF Grouping		Mean	N	Property
	A	3.733	75	DA
B	A	3.625	64	ECM
B	A	3.525	59	PSI
B		3.463	54	PSD
B		3.430	65	DP

Properties fall in two significantly different groupings for both the derived data and the scalar data. The scalar data show that the subjects were relatively unsure of the grammaticality of the sentences illustrating DP. They correctly accepted 87% of the ungrammatical sentences but the mean rating is the lowest of all properties.

DD - REGWF Grouping	% CORR REJ Mean	Property
A	95%	PSI
A	95%	PSD
A	83%	ECM
B	59%	DA
C	33%	DP

SD - REGWF Grouping		Mean	N	Property
	A	1.5682	44	DA
B	A	1.4000	25	DP
B		1.3065	62	ECM
B		1.2394	71	PSI
B		1.2254	71	PSD

The derived data indicate that the properties fall in three significantly groupings for correctly rejecting sentences, whereas the scalar data show only two groupings. They performed significantly differently on DA and DP, but they did not rate them as significantly different.

F3300 Internal ANOVA

DD - REGWF Grouping	% CORR ACC Mean	Property
A	95%	DA
A	93%	DP
A	87%	PSD
A	83%	ECM
A	79%	PSI

SD - REGWF Grouping	Mean	N	Property
A	3.8310	71	DA
B	3.5846	65	PSD
B	3.5763	59	PSI
B	3.5429	70	DP
B	3.5323	62	ECM

No significant difference was found for correctly accepting the properties.

DD - REGWF Grouping		% CORR REJ Mean	Property
	A	95%	PSI
	A	92%	PSD
B	A	73%	ECM
B	C	56%	DA
	C	40%	DP

SD - REGWF Grouping	Mean	N	Properties
A	1.5333	30	DP
A	1.4762	42	DA
A	1.4364	55	ECM
B	1.2029	69	PSD
B	1.1690	71	PSI

The properties fall in three significantly groupings for the first ANOVA and in two groupings for the second ANOVA.

F4000 Internal ANOVA

DD - REGWF Grouping		% CORR ACC Mean	Property
	A	97%	DA
B	A	97%	DP
B	A	89%	ECM
B	A	85%	PSI
B		85%	PSD

SD - REGWF Grouping		Mean	N	Property
	A	3.8630	73	DA
B	A	3.6875	64	PSI
B		3.6406	64	PSD
B		3.5616	73	DP
B		3.5522	67	ECM

There is a discrepancy between the subjects' performance and their perception of grammaticality. They successfully accepted

97% of the DP but the mean rating is relatively low and closer to 3 than to 4.

DD - REGWF Grouping		% CORR REJ Mean	Property
	A	96%	PSI
	A	89%	PSD
B	A	81%	ECM
B		64%	DA
	C	41%	DP

SC - REGWF Grouping	Mean	N	Property
A	1.5246	61	ECM
A	1.5161	31	DP
A	1.4167	48	DA
B	1.1642	67	PSD
B	1.1389	72	PSI

FNS Internal ANOVA

DD - REGWF Grouping	% CORR ACC Mean	Property
A	100%	DA
A	100%	PSI
A	99%	DP
A	97%	PSD
A	95%	ECM

SD - REGWF Grouping		Mean	N	Property
	A	3.9600	75	DA
	A	3.9333	75	PSI
B	A	3.8904	73	PSD
B	A	3.8732	71	ECM
B		3.7838	74	DP

No significant difference was found for correctly accepting the properties, but the scalar results, which show two significantly different groupings, indicate that the French native speakers attributed a varying degree of grammaticality to some properties.

DD - REGWF Grouping	% CORR REJ Mean	Property
A	99%	PSI
A	97%	DA
A	96%	ECM
A	92%	DP
A	89%	PSD

SD - REGWF Grouping	Mean	N	Property
A	1.1250	72	ECM
A	1.1216	74	PSI
A	1.1194	67	PSD
A	1.1096	73	DA
A	1.1014	69	DP

S2200 Internal ANOVA

DD - REGWF Grouping		% CORR ACC Mean	Property
	A	92%	DA
B	A	77%	PSI
B	A	67%	DP
B	A	67%	PSD
B		61%	ECM

SD - REGWF Grouping	Mean	N	Property
A	3.6957	69	DA
A	3.6250	40	DP
A	3.6207	58	PSI
B	3.3600	50	PSD
B	3.3043	46	ECM

Two significantly different groupings were found for correctly rejecting ungrammatical sentences, and the subjects' perceived degree of grammaticality seems to be a good predictor of their performance.

DD - REGWF Grouping			% CORR REJ Mean	Property
	A		96%	PSI
B	A		80%	PSD
B	A	C	77%	ECM
B		C	60%	DA
		C	52%	DP

SD - REGWF Grouping		Mean	N	Property
	A	1.7556	45	DA
B	A	1.5641	39	DP
B	C	1.5000	58	ECM
B	C	1.3750	72	PSI
	C	1.3000	60	PSD

The three groupings indicate that the subjects' performance was significantly different depending on the property tested. Once again, the subjects' perceived degree of grammaticality seems to be a relatively good predictor of their performance.

S3300 Internal ANOVA

DD - REGWF Grouping	% CORR ACC Mean	Property
A	93%	DA
A	88%	DP
A	87%	PSI
B	55%	PSD
B	52%	ECM

SD - REGWF Grouping		Mean	N	Property
	A	3.6286	70	DA
	A	3.5849	53	DP
B	A	3.5077	65	PSI
B	C	3.3077	39	ECM
	C	3.2195	41	PSD

The properties fall in two significantly different groupings for the derived data and in three significantly different groupings for the scalar data. Once again, we may say that the subjects' perceived degree of grammaticality is reflected in their performance. The higher the percentage is to 100%, the closer is the mean rating to 4.

DD - REGWF Grouping	% CORR REJ Mean	Property
A	96%	PSD
A	96%	PSI
B	71%	ECM
C	33%	DP
C	33%	DA

SD - REGWF Grouping			Mean	N	Property
	A		1.840	25	DA
B	A		1.642	53	ECM
B	A	C	1.640	25	DP
B		C	1.444	72	PSD
		C	1.389	72	PSI

S4000 Internal ANOVA

DD -REGWF Grouping		% CORR ACC Mean	Property
	A	88%	DA
	A	87%	PSI
	A	82%	DP
B	A	67%	PSD
B		51%	ECM

SD - REGWF Grouping		Mean	N	Property
	A	3.7692	65	PSI
B	A	3.6122	49	DP
B	A	3.6061	66	DA
B	A	3.5526	38	ECM
B		3.4600	50	PSD

Two groupings were found for both ANOVAs. However, there is a discrepancy between the subjects' performance and their rating of the sentences. For example, only 51% of the ECM instances were correctly accepted, but the mean rating is relatively high, being closer to 4 than to 3.

DD - REGWF Grouping		% CORR REJ Mean	Property
	A	95%	PSD
	A	95%	PSI
	B	72%	ECM
	C	48%	DA
	C	36%	DP

SD - REGWF Grouping		Mean	N	Property
	A	1.7778	36	DA
	A	1.7407	27	DP
	B	1.4815	54	ECM
C	B	1.2676	71	PSI
C		1.2535	71	PSD

The properties fall into the same number of groupings for both ANOVAs, and the mean percentages for correctly rejected sentences seem to correspond to the degree of grammaticality perceived by the subjects.

SNS Internal ANOVA

DD - REGWF Grouping		% CORR ACC Mean	Property
	A	99%	PSI
B	A	92%	DA
B	A	90%	DP
B	A	85%	ECM
B		80%	PSD

SD - REGWF Grouping	Mean	N	Property
A	3.9730	74	PSI
A	3.9565	69	DA
B	3.7969	64	ECM
B	3.6852	54	DP
B	3.6500	60	PSD

DD - REGWF Grouping	% CORR REJ Mean	Property
A	100%	PSI
A	95%	DA
A	92%	PSD
A	91%	ECM
B	68%	DP

SD - REGWF Grouping	Mean	N	Property
A	1.3088	68	ECM
A	1.2941	51	DP
A	1.2817	71	DA
A	1.1733	75	PSI
A	1.1594	69	PSD

Surprisingly, the properties fall into two significantly different groupings for correctly rejecting sentences.

To sum up, the best result is obtained by the F3300 group for which no significant difference was found among all five properties in terms of correctly accepting sentences (F (4, 70) = 2.35, $p < .06$); consequently, only one grouping was found. Not only did that group of subjects seem to have acquired all the properties tested at the time of the experiment, but the mean (87%) indicates that subjects performed quite well and better than chance for all properties.

However, some caution is in order. The mean for the percentage of correctly rejected ungrammatical sentences is significantly lower than for correctly accepted grammatical sentences (71% vs 87%) where three groupings were found for all non native groups including the F3300 group with highly significant differences (*F* (4, 70) = 10.72, *p* < .0001). Once again, the results of the SNS group, which does show two significantly different groupings for correctly rejected sentences, are surprisingly different from the FNS group.

Rejecting versus accepting

Overall, subjects were much better at correctly accepting grammatical sentences (mean = 84%) than at correctly rejecting ungrammatical sentences (mean = 76%). The non native French groups performed better than chance (68% or better) on accepting sentences for all properties, whereas all three groups, F2200, F3300 and F4000 failed to perform better than chance on DA and DP. As far as accepting, the S2200 group failed to perform better than chance for DP, PSD and ECM, the S3300 and S4000 groups failed to perform better than chance for PSD and ECM. As far as correctly rejecting ungrammatical sentences, all three Spanish groups, just like the French groups, failed to perform better than chance for DA and DP. In other words, a comparison between properties for correctly accepting and correctly rejecting, indicates that even if subjects accepted a high percentage of DA and DP, they were also unable to correctly reject a great number of the ungrammatical counterparts of these properties: 95% vs 56% and 93% vs 40% respectively. This failure to reject ungrammatical sentences suggests that some subjects may not have been aware, at the time of testing, that French or Spanish do not allow double NP structures or passive dative alternation. In other words, these subjects appear to assume that French or Spanish allowed the same structures as the L1. That assumption was expected, especially during the beginning stages of second language acquisition. So the results for accepting sentences provide stronger evidence in favor of the parameter resetting hypothesis than do the results for rejecting sentences. However, as mentioned above, no definite conclusion may be drawn without a closer examination of accepting versus rejecting and a careful interpretation of these differences.

Correctly ACC VS Correctly REJ

F2200	DA	100%	59%
	DP	87%	33%
	ECM	85%	83%
	PSI	79%	95%
	PSD	72%	95%
F3300	DA	95%	56%
	DP	93%	40%
	PSD	87%	92%
	ECM	83%	73%
	PSI	79%	95%
F4000	DA	97%	64%
	DP	97%	41%
	ECM	89%	81%
	PSI	85%	96%
	PSD	85%	89%

FNS	DA	100%	97%
	PSI	100%	99%
	DP	99%	92%
	PSD	97%	89%
	ECM	95%	96%

As stated above, the three French experimental groups were worse at correctly rejecting ungrammatical sentences for all properties except for PSI and PSD. The most striking contrast is for DA (mean correctly ACC = 97% vs mean correctly REJ = 60%) and DP (mean correctly ACC = 92% vs mean correctly REJ = 38%); so there is a common trend with all three French experimental groups. Surprisingly, the French native speakers follow the same trend in that the means for correctly rejecting sentences are slightly lower than the means for correctly accepting sentences.

The Spanish experimental groups' performance is similar to the French experimental groups' results in that they too performed worse at correctly rejecting than accepting sentences for DA and DP. However, they performed better at correctly accepting than correctly rejecting PSI, PSD and ECM (mean CORR ACC = 55% vs mean CORR REJ = 73%). They performed quite poorly with DA and DP. The Spanish native speakers differ from the French native speakers in that they performed better, not worse, at rejecting than accepting, except for DP whose mean of 68% is surprisingly low.

		Correctly ACC	vs	Correctly REJ
S2200	DA	92%		60%
	PSI	77%		96%
	DP	67%		52%
	PSD	67%		80%
	ECM	61%		77%
S3300	DA	93%		33%
	DP	88%		33%
	PSI	87%		96%
	PSD	55%		96%
	ECM	52%		71%
S4000	DA	88%		48%
	PSI	87%		95%
	DP	82%		36%
	PSD	67%		95%
	ECM	51%		72%
SNS	PSI	99%		100%
	DA	92%		95%
	DP	90%		68%
	ECM	85%		91%
	PSD	80%		92%

These facts will be further examined below.

B - French and Spanish properties will be acquired in the same way.

Overall results

First of all, the results of the grammaticality judgment task show that overall French subjects performed significantly better than the Spanish subjects at correctly accepting grammatical sentences ($F\ (9,\ 590) = 17.56,\ p < .0001$):

DD - REGWF Grouping	NNSs and NSs	% CORR ACC
A	French	90%
B	Spanish	78%

SD - REGWF Grouping	NNSs and NSs	N	Mean
A	French	1353	3.6903
B	Spanish	1120	3.6241

Furthermore, a strong interaction was found between levels of proficiency and properties (F=2.97, df=28, $p < .0001$), indicating that the subjects at the various levels of proficiency performed very differently depending on the syntactic properties. The same interaction was found for rejecting sentences even if no significant difference was found between the two language groups as far as correctly rejecting ungrammatical sentences (F (9, 590) = 27.77, $p < .0001$):

REGWF Grouping	NNSs and NSs	% CORR REJ
A	French	78%
A	Spanish	74%

Thus the French groups performed significantly better than the Spanish groups. The French groups' mean rating for correctly rejecting ungrammatical sentences is closer to 1, and the mean rating for correctly accepting grammatical sentences is closer to 4.

Based on the means for percentage of correctly accepted and percentage for correctly rejected for each language groups, and the various groupings for the proposed properties, the hypothesis that French and Spanish subjects would acquire the proposed cluster of properties in a similar way cannot be accepted. This is further evidence against the parameter resetting approach. Not only was little evidence for clustering found overall, but these results show that the same properties subsumed under a parameter are not acquired in the same way in French and Spanish. If the parametric approach were tenable, the acquisition of French and Spanish--languages alike in the relevant syntactic dimensions--should be similar. We have seen that this prediction was not verified.

Analysis by sentence sets

a - French

1 - Dative alternation

SID 38 - Marc a envoyé un paquet à son cousin

33 - * Marc a envoyé son cousin un paquet

	% NNSs	F2200	F3300	F4000	FNS
CA	100%	15 100%	15 100%	15 100%	15 100%
CR	58%	9 60%	9 60%	8 53%	15 100%

The sentence (38) was correctly accepted by all the nonnative subjects but 42% failed to correctly reject its ungrammatical equivalent, with F4000 doing the worst of all groups since 47% of the subjects failed to correctly reject (33). These results seem to imply that 42% of the F4000 groups assume that French is similar to English in allowing [NP NP] and [NP PP] structures. They may be overgeneralizing by transferring the double NP structure into the L2.

SID 36 - Ils donnent un jouet à l'enfant

31 - * Ils ont donné l'enfant un jouet

	% NNSs	F2200	F3300	F4000	FNS
CA	98%	15 100%	14 93%	15 100%	15 100%
CR	53%	6 40%	7 47%	11 73%	13 87%

47% of the subjects overall failed to correctly reject (31) and did not do quite as well for correctly accepting (36).

Even 2 native speakers failed to reject the ungrammatical sentence. The worst performance is from the F2200 groups where only 40% of the subjects correctly rejected the double NP structure. Only 1 subject from the F3000 group rejected (36) and changed it to correct in the correction task.

SID 37 - J'ai dit la vérité à Marc
32 - * J'ai dit Marc la vérité

	% NNSs	F2200	F3300	F4000	FNS
CA	98%	15 100%	14 93%	15 100%	15 100%
CR	78%	11 73%	11 73%	13 87%	15 100%

All subjects performed better with this set of dative alternation. The worst performance comes from F2200 and F3300 where 27% of the subjects failed to reject (32). Once again it is a subject from the F3000 group who rejected (37) and later changed it to correct.

SID 40 - Jean a offert un vélo à Pierre
35 - * Jean a offert Pierre un cadeau

	% NNSs	F2200	F3300	F4000	FNS
CA	98%	15 100%	14 93%	15 100%	15 100%
CR	40%	6 40%	6 40%	6 40%	15 100%

All experimental groups performed equally poorly at correctly rejecting the double NP structure. 60% failed to do so.

SID 39 - Eric prête le vélo à son frère

34 - * Eric prête son frère le vélo

	% NNSs	F2200		F3300		F4000		FNS	
CA	93%	15	100%	14	93%	13	87%	15	100%
CR	69%	12	80%	9	60%	10	67%	15	100%

40% of the F3300 group, 33% of F4000 and 20% of F2200 failed to correctly reject the ungrammatical sentence (34) while doing quite well in accepting its grammatical equivalent (93%, 87% and 100% respectively).

2 - Dative passive

SID 45 - * Pierre a été offert un livre

48 - Le cadeau a été offert à Eric

	% NNSs	F2200		F3300		F4000		FNS	
CA	95%	14	93%	14	93%	15	100%	15	100%
CR	22%	2	13%	4	27%	4	27%	14	93%

SID 49 - Un message a été envoyé à Jean

43 - * Son cousin a été envoyé un paquet

	% NNSs	F2200		F3300		F4000		FNS	
49	93%	12	80%	15	100%	15	100%	15	100%
43	29%	5	33%	3	20%	5	33%	14	93%

Subjects performed very well at correctly accepting the grammatical sentence but most of them were unable to reject the ungrammatical dative passive.

3 - Preposition stranding

SID 19 - C'est l'ami à qui j'écris
14 - * C'est l'ami que j'écris à

	% NNSs	F2200		F3300		F4000		FNS	
CA	89%	12	80%	13	87%	15	100%	15	100%
CR	96%	15	100%	13	87%	15	100%	15	100%

Subjects were better overall at rejecting than accepting correctly sentences. The difference is striking for F2200 (100% vs 80%). This difference between preposition stranding and dative alternation and dative passive may be explained by the assumption that classroom language learners may be explicitly taught that a preposition cannot be stranded in French. In other words they may be exposed to explicit negative evidence and appear to be have been able to use it. On the other hand, language instructors may very rarely draw their students' attention to ungrammatical dative passive and dative alternation structures and, in that case, second language learners would only be exposed to positive evidence.

SID 17 - C'est l'examen pour lequel j'étudie
12 - * C'est l'examen que j'étudie pour

	% NNSs	F2200		F3300		F4000		FNS	
CA	71%	6	40%	14	93%	12	80%	15	100%
CR	95%	14	93%	14	93%	15	100%	11	73%

These results contradict the results obtained on the preceding sentences. Here subjects were better overall at correctly rejecting than correctly accepting the PSD structures (95% vs 71%), with 60% of F2200 and 20% of F4000 failing to accept the grammatical sentence. So the conclusions drawn for (19) and (14) are not supported by (17) and (12).

SID 16 - C'est le ballon avec lequel je joue
11 - * C'est la raquette que je joue avec

	% NNSs	F2200		F3300		F4000		FNS	
CA	82%	10	67%	13	87%	14	93%	15	100%
CR	84%	14	93%	13	87%	11	73%	15	100%

These results are a little more consistent in that F3300 and FNS performed equally well at rejecting and accepting (16) and (11). However F2200 were better at rejecting than accepting (93% vs 67%) whereas F4000 were better at accepting than rejecting (93% vs 73%).

SID 6 - A qui Jean donne t-il le livre ?
1 - * Qui Jean donne t-il le livre à ?

	% NNSs	F2200		F3300		F4000		FNS	
CA	80%	12	80%	13	87%	11	73%	15	100%
CR	98%	14	93%	15	100%	15	100%	14	93%

In this case, all groups except for FNS performed better at rejecting than accepting.

SID 9 - Avec qui Paul joue t-il ?

4 - * Qui Jean joue t-il avec ?

	% NNSs	F2200		F3300		F4000		FNS	
CA	80%	11	73%	12	80%	13	87%	15	100%
CR	91%	14	93%	14	93%	13	87%	15	100%

We have similar results here also.

b - Spanish

1 - Dative alternation

SID 38 - Juan le ha mandado un paquete a su primo

33 - * Marcos ha mandado su primo un paquete

	% NNSs	S2200		S3300		S4000		SNS	
CA	95%	15	100%	14	93%	14	93%	14	93%
CR	40%	5	33%	6	40%	7	47%	14	93%

SID 39 - Eric le presta la bicicleta a su hermano

34 - * Eric presta su hermano la bicicleta

	% NNSs	S2200		S3300		S4000		SNS	
CA	93%	15	100%	15	100%	12	80%	14	93%
CR	62%	13	87%	6	40%	9	60%	14	93%

SID 36 - Le han dado un juguete al niño

31 - * Han dado el niño el juguete

	% NNSs	S2200		S3300		S4000		SNS	
CA	89%	12	80%	14	93%	14	93%	14	93%
CR	56%	10	67%	6	40%	9	60%	15	100%

SID 37 - Le he dicho la verdad a Marcos

32 - * He dicho Marcos la verdad

	% NNSs	S2200		S3300		S4000		SNS	
CA	85%	13	87%	12	80%	13	87%	13	87%
CR	33%	8	53%	2	13%	5	33%	14	93%

All subjects were better at correctly accepting grammatical sentences than at correctly rejecting their ungrammatical counterpart. They performed especially poorly on the first set of (40% overall) and last set (33%) of sentences.

2 - Preposition stranding

SID 6 - ¿A quién le da Juan el libro?

1 - *¿Quién le da Juan el libro a?

	% NNSs	S2200		S3300		S4000		SNS	
CA	87%	13	87%	13	87%	13	87%	15	100%
CR	98%	14	93%	15	100%	15	100%	15	100%

SID 9 - ¿Con quién juega Juan?

4 - *¿Quién juega Juan con?

	% NNSs	S2200		S3300		S4000		SNS	
CA	89%	13	87%	13	87%	14	93%	14	93%
CR	98%	15	100%	15	100%	14	93%	15	100%

SID 20 - Es la chica con quien salgo

15 - * Es el hombre que salgo con

	% NNSs	S2200		S3300		S4000		SNS	
CA	76%	12	80%	10	67%	12	80%	14	93%
CR	91%	14	93%	14	93%	13	87%	14	93%

SID 16 - Es el balón con el que juego
11 - *Es la raqueta que juego con

	% NNSs	S2200		S3300		S4000		SNS	
CA	64%	11	73%	7	47%	11	73%	14	93%
CR	91%	11	73%	15	100%	15	100%	14	93%

SID 19 - Es el amigo a quien escribo
14 - *Es el amigo que escribo a

	% NNSs	S2200		S3300		S4000		SNS	
CA	60%	9	60%	7	47%	11	73%	12	80%
CR	91%	12	80%	14	93%	15	100%	14	93%

SID 17 - Es el examen para el que estudio
12 - *Es el examen que estudio para

	% NNSs	S2200		S3300		S4000		SNS	
CA	51%	8	53%	8	53%	7	47%	5	33%
CR	87%	10	67%	15	100%	14	93%	13	87%

This time, subjects were better at correctly rejecting ungrammatical sentences than at correctly accepting grammatical sentences performing very poorly on the last set of sentences where only 51% of the subjects overall correctly accepted the grammatical structure. And very surprisingly only 33% of the native speakers correctly accepted (17). This discrepancy between results of dative alternation and preposition stranding does not mean that subjects have acquired PS and not DA since they performed poorly on accepting sentences. However, it may be interpreted as a difference in the way PS and DA are taught. As suggested above, language teachers may provide students with explicit negative evidence regarding PS. Students' attention may repeatedly be drawn to the fact that Spanish does not allow a preposition to be stranded at the end of a sentence, whereas teachers may rarely mention that double NP structures are an ungrammatical dative form in Spanish.

3 - Dative passive

SID 48 - El libro fue dado a Eric

45 - *Juan fue dado un libro

	% NNSs	S2200	S3300	S4000	SNS
CA	80%	9 60%	15 100%	12 80%	12 80%
CR	42%	8 53%	5 33%	6 40%	7 47%

Although a single set does not allow us to draw definite conclusions, we may say that the results of dative passive are similar to dative alternation, in that subjects performed well at correctly accepting grammatical sentences, but reveal that their L2 grammar overgeneralizes by allowing an animate subject in a dative passive sentence. Once again, students may not simply be told that such structures are ungrammatical in Spanish. We may say that they have not yet been exposed to sufficient positive evidence to come to such a conclusion, in spite of the fact that S2200 subjects, who were enrolled in their second year of Spanish, outperformed all other groups including native speakers. This is problematic if native speaker performance is to be used as the norm against which learners' performance is measured.

While Davies (1991) points out that "applied linguistics makes constant appeal to the concept of native speaker" (p.1), he also stresses the fact that it is increasingly difficult to provide a definition of what a native speaker is. According to Davies, "the term native speaker is used in two distinct (but related) senses. . .The first is that in some way the native speaker is taken. . .to represent an idealised model. The second is that an individual native speaker is him/herself used as an exemplar of such a model" (pp. 6-7). In other words, the native speaker is taken to be both the arbiter of the grammar and the model for the grammar (Chomsky 1965, p.24). This amounts to saying that the native speaker represents both the norm against which to measure non-native speaker performance, and the criterion for absolute grammaticality. However, as Long (1981, 1985) points out, there is no evidence of native speaker performance against which to compare the performance of nonnative speakers. In fact, the results of the present study suggest that native speaker performance may show as much variation as non-native speaker performance. This variation may be explained by several factors. First of all, according to Davies (1991, p.89), native speakers do differ in terms of proficiency, control of style, oratory, registry, range of vocabulary, and do not all share the same dialect. This may be the case for the Spanish native speakers who participated in this experiment. They were all college educated but came from different Spanish speaking countries such as Puerto Rico, Guatemala, Spain or Cuba. This lack of background homogeneity may be a factor. Correlations were measured between the speakers' performance on correctly rejected sentences and correctly accepted sentences, and background data information such as age, age of arrival, length of residence and years of formal exposure. No correlation was found for native speakers (see Appendix F). Only one correlation was found for nonnative speakers. A significant correlation was found between grammatical self-assessment and correctly rejected sentences for F2200 ($r = 0.610$, $p < .01$).

Peripheral Issues

There were two peripheral issues related to the parameter resetting approach. The first issue is the relation between the proficiency level of the learners and their performance on the experimental tasks. The second language literature offers no principled account of the relationship between the learners'level of proficiency and their performance on various tests. However, it is often implied that the performance is expected to improve with the level of proficiency. White (1985) tested the acquisition of the pro-drop parameter on adult native speakers of Spanish learning English as a second language. She reports that Spanish speakers showed improvement with increasing levels of proficiency. There was a "gradual improvement in ability to recognize the ungrammaticality" of incorrect sentences (White 1985, p.53). There are a few exceptions for which no explanation was offered.

The following results of the present study do not confirm White's results since no significant difference was found among nonnative language groups for correctly rejecting ungrammatical sentences. Second, even though some significant differences were found for correctly accepting grammatical sentences, the three different groupings show that, for example, the performance of SNS was not significantly different from that of F2200, the lowest level of proficiency! So the percentages for accepting show that overall FNS performed significantly better than all other groups (except F4000).

Percentage of accepting:

REGWF Grouping

A FNS 98% F4000 91%

B F4000 91% F3300 87% SNS 87% F2201 84%

C S3300 73% S4000 73% S2201 71%

Percentage of rejecting:

REGWF Grouping

A FNS 95% SNS 89%

B F4000 74% S2201 73% F2201 73% F3300 71% S4000 69%
S3300 66%

The percentages of rejecting are less surprising in that both native speaker groups performed significantly better than all the nonnative groups. But overall, it must be concluded that the level of performance did not improve with the level of proficiency.

The second peripheral issue related to the parameter resetting approach was the timing of the grammaticality judgment task. Timing was included in an attempt to establish a correlation between time and performance. There is no significant difference overall between French and Spanish groups in the amount of time they took to correctly accept grammatical sentences or correctly reject ungrammatical sentences.

Correctly accepting (F (1, 2471) = 0.20, $p < .6577$):

REGWF Grouping	Mean	Language Group
A	5.168	spanish
A	5.095	french

Correctly rejecting (F (1, 2286) = 1.39, $p < .2389$):

REGWF Grouping	Mean	Language Group
A	4.774	spanish
A	4.567	french

However there is a highly significant difference between correctly accepting and correctly rejecting when combining all language groups together (F (3, 4757) = 5.45, $p < .001$):

REGWF Grouping	Mean	Correctly ACC/Correctly REJ
A	5.128	correctly accept
B	4.668	correctly reject

So French and Spanish subjects took significantly more time to correctly accept grammatical sentences than to correctly reject ungrammatical sentences. Let us recall that overall subjects performed better at accepting than rejecting sentences. The results show that F2200 were significantly faster at correctly accepting than all groups except for S2200 and S3300 (F (7, 2465) = 15.06, $p < .0001$), while SNS were the slowest and significantly slower than all groups except for FNS (see appendix B). F2200 and S2200 were significantly faster at rejecting than F3300, FNS and SNS (F (7, 2280) = 6.67, $p < .0001$). Looking at each language group individually, a significant difference between accepting and rejecting was found only for F2200. None of the other language groups were significantly faster at correctly rejecting or accepting sentences. However, significant differences were found between properties for accepting for F2200, FNS, S2200, S3300 and S4000; all groups had two or three (S3300) significantly different groupings. No significant difference between properties was found for F3300, F4000 and SNS.

The timing results for correctly rejecting also show significant differences between properties with two or three groupings for each language groups except for FNS where no significant difference was found. The timing results and the grammaticality judgment task results reveal the same consistency in rejecting sentences and variability in accepting sentences. As stated above, subjects took more time to perform better at accepting than rejecting sentences. They have taken longer because they may have read the sentences twice to make sure they were correct due to a lack of self-confidence in their own judgment or simply to confirm their first impression. Or they have taken less time to correctly reject ungrammatical sentences because they were able to detect the error immediately. Another possibility is that they may not even have finished reading the sentence because its ungrammaticality made it difficult to process. Considering the poor general performance for correctly rejecting sentences, the second alternative may be more likely. The finding that the longer the subjects took, the better they performed, seems to lead to the conclusion that the subjects tested in that study may need more time than they allowed themselves to correctly reject ungrammatical sentences. Or it may simply be at they had not acquired these properties yet.

Cook (1990) used a timed comprehension task assuming that "the time involved in coming to a decision about the interpretation of the sentence may in itself reflect its difficulty to the learner, regardless of whether the answer is right or wrong" (p. 577). Contrary to the present research, the subjects tested in that study were told that they were being timed and, as in the present research, they were instructed to proceed quickly. Cook's overall results show a significant correlation between comprehension and response time and a correlation in terms of the difficulty orders for sentences types for pronominals and anaphors. Cook concludes that "error rates in comprehension and timing do seem to measure the same performance difficulty" (p. 592). This conclusion is extended to grammaticality judgments where it seems that time measurements correlate with success or failure of judgement, although that doesn't necessarily imply that correct judgments take less time (Cook 1989). This is indeed what was found in the present study where, overall, subjects took longer to perform better.

Learnability perspective

H - The acquisitional sequence of the proposed properties will show that second language learners follow the Subset Principle.

The Subset Principle (SP) stipulates that, where one hypothesized language is a subset of another, the learner will acquire first the smallest language compatible with the positive evidence available (Berwick 1985, p.236). Berwick (1985) uses the SP as a general learning constraint guiding first language acquisition. What does the SP mean when applied to second language acquisition?

In the present study, the subjects were learning French or Spanish which are subsets of English as far as the tested syntactic properties are concerned. If the SP, as defined by Berwick (1985) applies, the results should show that subjects were in the process of acquiring the tested properties on the basis of positive evidence alone. In other words, they should assume that French and Spanish, allow datives of the form [NP PP], as in (1a) and (1b), since they should have received positive evidence to that effect. On the other hand, they could not have been exposed to positive evidence suggesting that French or Spanish allows double NP dative structures as in (2a) and (2b), since these forms are ungrammatical in these languages.

1 - a. Jean donne le livre à Marc
    b. Juan le da el libro a Marcos
2 - a. * Marc est donné le livre
    b. * Marcos es dado el libro

Therefore, if the subjects follow the Subject Principle, the results should show that subjects correctly accepted instances of [NP PP] structures, but failed to reject [NP NP] structures. The results do confirm that prediction since overall, subjects accepted rather than rejected a higher percentage of dative alternation and dative passive sentences. In other words, these subjects were able to recognize the grammatical [NP PP] dative forms and the dative passive forms, but they were not able to rule out the dative alternation forms and the alternate dative passive forms. These forms cannot be part of the input the subjects were exposed to since they are ungrammatical in French and Spanish. On the other hand, the fact that, overall, subjects performed better at rejecting (PSI= 96%, PSD=91%) rather than accepting (PSI=86%, PSD=76%) instances of preposition stranding, lends support to the claim that they were indeed guided by a learning principle such as the Subset Principle. Neither French nor Spanish allows stranded prepositions in declarative or interrogative sentences. Learners are never exposed to any kind of evidence suggesting otherwise. The low percentage for accepting instances of PSD may be explained by the fact that, although preposition stranding is considered to be a marked phenomenon in the Government and Binding framework, it seems to be preferred to pied piping; a second explanation is suggested in light of the results of the correction task which indicate that quite a few subjects made mistakes on the relative pronoun itself, not on its place in the sentence. An alternative analysis is proposed by Bardovi-Harlig (1988) who found that preposition stranding (the marked form) was acquired before pied piping (the unmarked form) in both questions and relative clauses.

This result contradicts the prediction made by the markedness hypothesis according to which the unmarked construction should be acquired first. Bardovi-Harlig suggests that "if salience is defined in terms of availability of data, we see that the two rules have unequal salience. . .in fact the data available to the learner does not seem to be enough to trigger the acquisition of pied piping before stranding in spite of the fact that it is the marked construction" (p.23).

The results for Exceptional-Case marking do not provide such a clear picture, even if overall, subjects were better at correctly rejecting (80%) than correctly accepting (75%), which is not significantly different. So we may say that the second language learners who participated in the present study do not seem to apply the SP since they are overgeneralizing, using a superset grammar. They were able to reject or accept sentences based on the positive evidence they had been exposed to. However, when confronted with structures which are ungrammatical in the L2 but grammatical in the L1, for which they had not received positive evidence, they failed to reject or accept them, depending on the structure in question. More specifically, the subjects performed better at accepting than rejecting dative alternation and dative passive which overlap in the native language and the target language. Whereas they performed better at rejecting than accepting Exceptional-Case marking and preposition stranding, for which the native language, English, is the superset.

This is where it becomes obvious that first language acquisition learning principles cannot simply be applied as such to second language acquisition. Second language learners cannot be expected to erase their L1 knowledge. In the absence of positive evidence from the L2, they will naturally (consciously or unconsciously) rely on their L1 knowledge. If the L2 is a subset of the L1, the lack of negative evidence will lead them to overgeneralize until they realize that the L2 allows only a subset of the L2 structures. In other words, they will need indirect or direct negative evidence to learn to constrain their L2 grammar.

Wexler and Manzini (1987) and Manzini and Wexler (1987) have suggested a more narrow interpretation of the Subset Principle within a parametric theory of language acquisition. Within that perspective, the SP is seen as an independent learning principle interacting with principles of Universal Grammar to guide the setting of UG parameters. Wexler and Manzini (1987) propose that the languages generated by the various values of a UG parameter stand in a strict subset relation to one another. That restriction, the Subset Condition, allows the Subset Principle to apply, and markedness hierarchies can be defined on the basis of the subset relations among the languages generated by a parameter's values. Let us extend that argument to the properties subsumed under a potential parameter. If the Subset Condition holds and the Subset Principle applies, second language learners will acquire the various properties of a parameter one by one, proceeding from the most unmarked to the most marked property.

The results obtained in this study lend partial support to that argument, since the various groupings indicate that the various properties were acquired individually as opposed to simultaneously. It may be reasonable to assume that second language learners follow a markedness scale (see discussion) in the acquisition of the cluster of properties.

Therefore the hypothesis within a learnability perspective cannot be rejected since it seems that the subjects were following the Subset Principle as a learning principle in some cases: properties were not acquired as a cluster but individually. So we may say that the results provide partial evidence for the Subset Principle as a learning principle in second language acquisition. However, the fact remains that when the native language is the superset and the native language and the target language overlap, learners seem to, at least initially, overgeneralize and use a superset grammar.

Results of the Correction Task

The purpose of the correction task was to find out whether the proper syntactic criteria were applied in rejecting ungrammatical sentences. One cannot assume that linguistically naive subjects automatically reject ungrammatical sentences because they were able to detect the error the researcher hoped they would detect. Subjects may reject sentences for a number of reasons, some of which can be semantically based. In this study, an attempt to avoid this type of pitfall was made by instructing the subjects that there were no errors of spelling, agreement, word choice or tense on conjugated verbs. The data obtained from the correction task were printed out and analyzed by proficiency level, by property and by language. The corrections were organized by categories:

CR = correctly rejected - the percentage of sentences subjects correctly rejected.

GC = grammatically corrected - the percentage of sentences (out of the correctly rejected sentences) for which subjects provided the relevant correction and which resulted in a grammatical sentence.

UGC = ungrammatical/grammatically corrected - the percentage of sentences for which subjects provided the relevant correction but which resulted in an ungrammatical sentence due to other factors - e.g. wrong relative pronoun.

UC = ungrammatical correction - not only the relevant correction was not made, but the resulting sentence was ungrammatical.

CS = change of structure - the subject completely changed the structure of the sentence by, for example, using an active form instead of a passive.

CC = changed to correct - the subject decided that the sentence was correct.

DK = don't know - the subject knew the sentence was incorrect but did not know how to correct it.

BL = blank - the subject did not provide any type of correction for unknown reasons.

Spanish - Summary by groups:

	CR	GC	UGC	UC	CS	CC	DK	BL
S2201	73%	59%	9%	6%	14%	8%	2%	1%
S3300	66%	67%	5%	2%	19%	5%	2%	1%
S4000	69%	64%	2%	6%	17%	5%	3%	3%
SNS	89%	94%	0%	0%	6%	0%	0%	0%

Overall the Spanish experimental groups successfully corrected 69% of the ungrammatical sentences they correctly rejected. The subjects' performance did not dramatically improve with the level of proficiency as one could have expected. On the contrary, S4000 was less successful than S3300 at providing appropriate corrections. However, the percentage of UGC declined as the level of proficiency increased. And as expected, there is a significant difference with the SNS who were able to correct 94% of the sentences they rejected. The percentage of CS is highest among the remaining categories. This may be interpreted as a strategy of avoidance on the part of the subjects, as a misunderstanding of a specific structure, or simply as a complete lack of understanding of the entire sentence. Surprisingly, that percentage is the lowest of all experimental groups for S2200, the lowest level of proficiency tested.

SPN experimental groups - Summary by property

	CR	GC	UGC	UC	CS	CC	DK	BL	U/GCtotal
PSI	96%	67%	6%	0%	24%	0%	1%	1%	73%
PSD	90%	54%	4%	7%	26%	1%	6%	3%	58%
ECM	73%	69%	12%	8%	2%	4%	1%	2%	81%
DA	47%	90%	0%	0%	1%	6%	1%	1%	90%
DP	40%	36%	0%	1%	17%	23%	3%	3%	36%

These figures show that a high rejection percentage does not necessarily guarantee a high correction percentage. In other words, subjects did correctly reject ungrammatical sentences but were not able to correct it. One example is PSD where 90% of the 25 ungrammatical sentences were rejected, but where only 54% of the corrections resulted in grammatical corrections, 4% were grammatical corrections which resulted in ungrammatical sentences due to other factors. A relatively high percentage of the corrections, 26%, were changes of structure which indicate that students did not understand the structure at all or simply did not know how to correct it. Some examples of change of structure are:

1 - * es la raqueta que juego con

juego con la raqueta

2 - * es el examen que estudio para

estudio para el examen

The figures for DP show not only that subjects performed poorly at correctly rejecting ungrammatical sentences (40%), but also that they were able to correct only 36%. 17% were a change of structure and 23% were changed to correct, after they had been rejected as incorrect. It is also interesting to note that it is the lowest level of proficiency, S2200, which performed the best at rejecting incorrect instances of dative passive (52%), followed by S4000 (35%) and S3300 (33%). However, S2200 were able to provide acceptable corrections for only 15% of the sentences they had rejected, whereas S3300 and S4000 corrected 56% and 38% respectively of the rejected sentences.

French - Summary by groups

	CR	GC	UGC	UC	CS	CC	DK	BL
F2200	73%	66%	15%	4%	9%	3%	1%	1%
F3300	71%	70%	11%	6%	5%	6%	0%	1%
F4000	74%	82%	6%	1%	5%	5%	1%	1%
FNS	95%	93%	4%	0%	2%	0%	0%	0%

Overall the French experimental groups successfully corrected 78% of the ungrammatical sentences they correctly rejected. There seems to be a correlation between the level of proficiency and the performance: the higher the proficiency level the better the performance on the correction task. Similarly, the percentage of UGC and CS diminish as the level of proficiency increases. As expected, the French native speakers were able to correct a much greater percentage of the sentences they had rejected than the experimental groups.

FRE exp - Summary by property

	CR	GC	UGC	UC	CS	CC	DK	BL	U/GCtotal
PSI	95%	94%	3%	2%	0%	0%	0%	1%	97%
PSD	92%	65%	18%	2%	10%	1%	1%	2%	83%
ECM	79%	80%	8%	9%	2%	1%	1%	0%	88%
DA	60%	67%	20%	1%	5%	5%	0%	0%	87%
DP	38%	36%	0%	5%	23%	19%	5%	1%	36%

Most of the UGC for PSD are due to the fact that subjects used the wrong relative pronoun:

ex. a. C'est l'examen que j'étudie pour
C'est l'examen pour quoi j'étudie

b. C'est le candidat qu'ils votent pour
C'est le candidat pour qu'ils votent

The high percentage of UGC for DA is due to a strict adjacency violation:

ex. a. J'ai dit Marc la vérité
J'ai dit à Marc la vérité

That mistake was made not only by all the non-native groups but by the French native speakers as well:

ex. a. Ils ont donné l'enfant un jouet
Ils ont donné à l'enfant un jouet

b. J'ai dit Marc la vérité

J'ai dit à Marc la vérité

c. Marc a envoyé son cousin un paquet

Marc a envoyé à son cousin un paquet

d. Eric prête son frère le vélo

Eric prête à son frère le vélo

e. Jean a offert Pierre un cadeau

Jean a offert à Pierre un cadeau

Out of 15 subjects, 5 provided the correction in (a), only 1 in (b) and (d), 3 in (c) and 4 in (e). That violation of the strict adjacency condition in French which requires that the direct object be placed directly after the verb, may simply be explained by too much precipitation on the part of the subjects. They realized that the preposition was missing and simply rewrote the sentence as such without thinking of the word order. Besides, the type of structures exemplified in these corrections is quite common in familiar, spoken French. Of course, there is always the possibility that French is moving toward a less strict adjacency condition. Some research would be needed to confirm that possibility.

The French experimental subjects performed as poorly as the Spanish experimental subjects as far as dative passive is concerned. Not only did they correctly reject only 38% of ungrammatical sentences, but when asked to correct them, they found 19% of them to be correct and changed the passive structure into an active structure 23% of the time:

ex. a. Pierre a été offert un livre

Pierre a offert un livre

There is no significant difference between SNS and FNS, but there is a significant difference between SNS and SPN experimental groups, as well as FNS and FRE experimental groups.

	FRE exp	SPN exp	
PSI	97%	73%	significant difference
PSD	83%	58%	significant difference
ECM	88%	81%	no significant difference
DA	87%	90%	no significant difference
DP	36%	36%	no difference at all
Total	78%	68%	

So, overall FRE experimental groups performed significantly better than the SPN experimental groups.

Let us recall that the program was designed to save for the correction task all sentences rated 1 or 2, regardless of whether these sentences were correctly rejected or not. Consequently, subjects were presented with ungrammatical but also grammatical sentences and were asked to correct them. The corrections provided to the grammatical sentences which subjects incorrectly rejected were analyzed and divided into the following categories:

R = sentence rejected

CC = changed to correct

SV = stylistic variation

ex. a. Pour qui Jean travaille t-il ?

Pour qui travaille t-il, Jean ?

UC = ungrammatical correction

ex. a. Le cadeau a été offert à Eric

Eric a été offert le cadeau

CW = change of word

ex. a. ¿Qué chico juzgas inteligente ?

¿Cuál chico juzgas inteligente ?

BL = blank

DK = don't know

CS = change of structure

ex. a. Un repas a été cuit pour les enfants

Les enfants ont cuit un repas

FRE experimental groups - Summary

	R	CC	SV	UC	CW	BL	DK	CS
PSI	11%	49%	30%	7%	12%	0%	2%	0%
PSD	11%	48%	0%	31%	0%	0%	12%	7%
ECM	9%	42%	0%	42%	6%	0%	9%	0%
DA	2%	67%	17%	0%	0%	0%	0%	17%
DP	4%	41%	18%	18%	0%	6%	6%	6%

SPN experimental groups - Summary

	R	CC	SV	UC	CW	BL	DK	CS
PSI	10%	36%	0%	17%	22%	8%	5%	11%
PSD	23%	36%	0%	12%	10%	8%	6%	27%
ECM	36%	12%	0%	23%	12%	6%	7%	16%
DA	6%	67%	0%	5%	14%	9%	0%	0%
DP	15%	16%	0%	37%	21%	5%	0%	2%

	R	CC	SV	UC	CW	BL	DK	CS
FREexp	7%	49%	13%	20%	4%	1%	4%	8%
SPNexp	18%	33%	0%	19%	16%	7%	4%	11%

Overall, the SPN exp groups rejected more grammatical sentences than the FRE exp groups (7% vs 18%); they found less of them to be correct (49% vs 33%). Both language groups produced almost the same number of ungrammatical corrections (FRE:20% vs SPN:19%).

In the sixth and last chapter, these results are summarized and relevant conclusions drawn.

CHAPTER 6
SUMMARY AND CONCLUSION

This study was designed to investigate the acquisition of a cluster of properties--namely, preposition stranding, Exceptional-Case marking, dative alternation and dative passive--by adult native speakers of English learning French or Spanish as a second language. Two perspectives were adopted: a parameter resetting perspective and a learnability perspective.

Within the parameter resetting perspective, it was hypothesized that the acquisition of any property would trigger the acquisition of the remaining properties. The results of the grammaticality judgment task provided only partial support in favor of this hypothesis since the ANOVAs show significantly different groupings for the individual syntactic properties tested. The overall results show three highly significant groupings for correctly accepted grammatical sentences and four highly significant groupings for correctly rejected ungrammatical sentences. The group results are more favorable to the hypothesis since only two groupings for correctly accepted sentences and three groupings for correctly rejected sentences were found. Only one grouping was found for the F3000 group and the FNS group but two groupings were found for the SNS group.

It may then be concluded that this study provides only inconclusive evidence in favor for or against parameter resetting. In other words, the results do not support the claim that second language acquisition is similar to first language acquisition in that it would consist in setting all the properties associated with the parameter to the appropriate value. This would have been triggered by positive evidence.

Before addressing the issue of parameter resetting, it must be stressed that the conclusion reached above is only valid for

- the time of testing, i.e., at a specific point in the interlanguage of the subjects. Since Selinker (1972), most second language acquisition researchers agree that second language learners have a 'language' of their own, or an interlanguage, which is neither the native language nor the target language. As they progress in their acquisition of the second language, their interlanguage will integrate more features pertaining to the target language and their competence will gradually approach the competence of native speakers.
- the proposed instantiations of the properties tested, i.e. we cannot claim that the results of this study apply to Exceptional-Case marking, preposition stranding, dative alternation and dative passive in general.
- group results as opposed to individual results for second language learners with similar formal instruction and similar biographical background (see appendix D and E). Group results

do not allow us to observe inter-learner variability which may be a significant factor in adult second language acquisition. Also, a formal exposure and a naturalistic exposure to the second language may result in different developmental patterns and acquisitional rates.

- a cross-sectional study as opposed to a longitudinal study. Since longitudinal studies involve collecting data at regular intervals over a certain period of time, they are able to account for the gradual growth of learners' competence at different developmental points. Cross-sectional studies do not offer such a window on the developmental route in second language acquisition.

Although the results of the present study are inconclusive, two recent studies, Hulk (1991) and Broselow and Finer (1991), have found support for parameter resetting in second language acquisition. Hulk (1991) investigated the acquisition of word order properties in L2 French by Dutch native speakers. The results appear to support the hypothesis that the learners would show the interaction of three parameters: the Head parameter, a (target of) verb movement parameter and a topicalization to SPEC, CP parameter. It was found that the learners tested were able to reset the Head parameter, for which there is positive evidence in French, but the resetting of the Topicalization parameter, for which positive evidence is not so readily available, proved to be much more difficult.

Hulk claims that:

> there is positive evidence available in French both for IVO word order and for the fact that movement of the finite verb in declarative sentences may stop at INFL both in matrix and embedded clauses. Embedded clauses clearly show the position of the finite verb in INFL between the subject and the VP. Root clauses with XSVO word order, where a (non-WH) constituent has been fronted (by IP-adjunction) constitutes positive evidence for the fact that INFL is the landing site for finite verb movement in French declaratives, and not C, because otherwise we would expect not a V3, but a V2 word order (XVSO as in Dutch). Consequently it seems plausible that INFL as a landing site for finite verb movement is discovered rather easily. (Hulk 1991, pp.14-15)

However, the learners seemed to have adopted parameter settings which fall within the constraints of Universal Grammar, even if they correspond neither to the L1 settings or the L2 settings. It is then concluded that this study provides support for a UG parameter resetting approach to language acquisition.

Broselow and Finer (1991) investigated the acquisition by native speakers of Hindi, Japanese, and Korean of two domains of English: in phonology, syllable onset clusters, and in syntax, binding patterns of reflexive anaphors. Multi-valued parameters have been posited for both domains and it is assumed as in the present study, that, following Berwick (1985) and Wexler and Manzini (1987), the initial setting of a parameter is the most restrictive setting. "Resetting of a parameter to a more marked setting is triggered by exposure to positive evidence (that is, by exposure to constructions outside the subset defined by the more restrictive setting). This assumption, Berwick's Subset Principle on learnability, makes explicit the connection between markedness and learnability" (p.36). The results indicate that "learners have neither retreated to the unmarked setting for a given parameter nor transferred the settings of their native language wholesale; instead, reponses tended to cluster around a parameter setting intermediate in markedness between those of the native and the target languages" (p.36). Broselow and Finer claimed that these results were observed for both parameters investigated, the Government Category Parameter for the binding of reflexive anaphors, and the Minimal Sonority Distance Parameter for the relative sonority of consonants in syllable onset clusters. Broselow and Finer concluded that principles of Universal Grammar do actually constrain the set of hypotheses that second language learners formulate about the target language.

Although the concept of principles and parameters within Universal Grammar is just as attractive for second language acquisition as it is for first language acquisition, we would like to suggest that the notion of parameter resetting for SLA needs to be somewhat revised if we are to provide an adequate theory of second language acquisition.

First of all, the term of "parameter resetting" is misleading, because it seems to imply that the values of a given parameter must be completely changed from setting A for the L1 to setting B for the L2, which in turn implies that a parameter can only be set on setting A or setting B. But then, how does a person who is fluent in both French and Spanish, for example, handle the pro-drop parameter? It seems that a bilingual is able to switch back and forth between the two values of the parameter, [-pro-drop] to [+pro-drop], depending on the language being used. The speaker should have the option of choosing any value, or switching to one or the other value depending on the language being used. This implies a high degree of automaticity as exemplified in bilingual speakers who possess a native speaker competence in both their languages.

This is consistent with a line of argumentation by Cook (1990) who suggests that "a bilingual is not just two monolinguals with two different settings; rather he or she possesses a single overall grammar that emcompasses two or more settings for each parameter" (Cook 1990, p.594).

Second, it is argued that the term "parameter resetting" is misleading because it betrays a monolingual view of the mind/brain which is not tenable when one considers that in many countries, it is multilingualism and not monolingualism that is the norm. Cook (1991a) goes so far as to say that:

> The typical environment includes input in more than one language; monolinguals are suffering from a form of language deprivation. Hence the broad poverty-of-the-stimulus argument should be, not how the mind manages to acquire a single grammar, but how it manages to acquire one or more grammars. In terms of a UG model the problem is not explaining how the mind sets a parameter from evidence; it is how it manages to acquire one or more settings from evidence. The basic claim is that the learning of multicompetence should be seen as the essential issue, monocompetence as the aberration. The problem of language

> acquisition is how one mind acquires one or more grammars from input. Chomsky's idealisation rules out most of the human race and does not cope with the perfectly normal condition of the human mind. (Cook 1991a, p.114-15)

Multilingualism is very common in many parts of the world, so we should look at second language learners as individuals who are very capable of acquiring a second or more languages. In doing so, they will acquire multi-competence, and ultimately, they will be multi-competent individuals, not ersatz native speakers as Cook (1991) rightly points out. As Cook suggests, multi-competence is "the compound state of a mind with two grammars" and people with multi-competence "are not simply equivalent to two monolinguals but a combination of its own" (Cook 1991, p.2). This view is shared by Grosjean (1989) who stresses that:

> The bilingual is NOT the sum of two complete or incomplete monolinguals; rather, he or she has a unique and specific linguistic configuration. The coexistence and constant interaction of the two languages in the bilingual has produced a different but complete linguistic entity (p.6).

This is not the view commonly expressed in the literature. Birdsong (1991a) points out that although "it is true that multilingualism is a prevalent state of affairs in many areas of the world, yet it is usually the case that these speakers began to learn their second language as children" (p.154). It is usually agreed that adult second language acquisition is bound to result in failure. Maturational constraints are often invoked to explain why adult learners do not attain native-like competence (Johnson and Newport 1989, Long 1990, Sorace 1991, Flynn and Manuel 1991). Few studies address the question of ultimate attainment in adult learners (Coppietiers 1987, Birdsong in press) and little evidence is found to support the claim that adult learners succeed in their acquisition of a second language. For instance, Birdsong (in press) does find evidence that adults can attain native-like competence, but attests a negative correlation between the age of arrival in the host country and native-like performance on various measures. However, Flynn and Manuel (1991) dismiss the lack of native-like achievement in adult learners arguing that such a failure is irrelevant to UG/L2 theory since "UG is not a theory of end state competence" (p.134). Birdsong (1991) takes issue with that argument pointing out that "surely UG/L2 theory addresses itself to end states as well. Indeed, the original formulation of the logical problem of L2 acquisition by White (1985) was based on a comparison of the end product of acquisition with available linguistic input" (p.155). Further research to investigate the question of ultimate attainment in adult second language acquisition is clearly needed to settle these issues. It is also necessary to reach a consensus as to what exactly may constitute failure or success in adult second language acquisition.

The results for the second hypothesis within the parameter resetting indicate that the second language learners of French and the second language learners of Spanish do not seem to be acquiring the properties tested in the same way. It was found that overall French learners performed significantly better than the Spanish learners at correctly accepting grammatical sentences. Furthermore, a strong interaction was found between levels of proficiency and properties indicating that the subjects at the four different levels of proficiency performed very differently depending on the syntactic properties. And the same interaction was found for correctly rejecting sentences even if no significant difference was found between the two language groups. The source of difference in performance between the Spanish subjects and the French subjects is not clear. One can only speculate that the learners of French and the learners of Spanish did not receive the same type or amount of formal instruction in the form of positive evidence.

It is also not clear why subjects performed so differently on correctly accepting grammatical sentences and correctly rejecting ungrammatical sentences. Zobl (in press) attempts to provide an answer. Based on the assumption that there is an epistemological distinction in the type of knowledge underlying the identification of a grammatical sentence versus an ungrammatical sentence, Zobl (in press) reviewed four studies--Felix 1988, Bley-Vroman, Felix and

Ioup 1988, White 1988 and Zobl 1989--which tested principles of Universal Grammar: the Empty Category Principle, Exceptional-Case marking, Subjacency, the Case Filter, the Specified Subject Condition, various extraction violations as well as long Wh-movement and backward anaphora. The review of these studies leads him to observe that non-native speakers are more uniform in their judgments of ungrammatical versus grammatical sentences. Zobl argues that this result supports the position that adults have access to Universal Grammar: "under the current conceptualization (cf. Fodor and Crain 1987) much of UG is formulated in terms of (negative) constraints which restrict the generalizations or inferences that can be entertained by the learner. The ability to recognize sentences infringing negative conditions of UG as ungrammatical hence becomes an important test of whether the domain-specific cognitive system is still active in adults" (Zobl in press, pp.4-5). That argument is supported by the results of other studies such as Bley-Vroman, Felix and Ioup (1988) who claim that "any type of linguistic knowledge for which there is no evidence in the input data must be attributed to UG, while knowledge that relates to a particular property of a given language must be derived from environmental data". In addition, their study reveals that non-native speakers were significantly better at rejecting ungrammatical examples (average score: 81%) than at accepting grammatical sentences (average score: 68%). This result is consistent with Felix (1988) who explains why judgments of ungrammaticality can be traced to access to UG:

> as a rule our subjects seem to have stronger intuitions about ungrammatical structures than about grammatical structures. This again, it seems to me, can be considered to support the view that they do have access to UG. If a sentence is ungrammatical because it violates a principle of UG, then other considerations such as stylistic or pragmatic factors are totally immaterial for determining its grammaticality status. The sentence simply remains ungrammatical by virtue of violating a principle of UG. If, however, a sentence does not violate any principles of UG and is thus grammatical from a UG perspective, it may still be unacceptable for other reasons having nothing to do with UG." (p.286)

Johnson and Newport (1988) also claim to have used only the ungrammatical items "since it is only the ungrammatical items which can be said to be testing any particular rule type. That is, when a subject marks a grammatical sentence as ungrammatical, it is unclear what part of the sentence, or grammar, (s)he is having problems with. In contrast, when a subject makes an ungrammatical sentence as grammatical, (s)he must have failed to represent just that structure under test as a native speaker would" (Johnson and Newport 1989, p.86).

So it is the ability to correctly reject ungrammatical sentences versus the ability to correctly accept grammatical sentences, which would indicate whether the subjects tested had actually acquired the relevant properties. Some level of success would still be necessary to determine whether the properties had been acquired or not. However, the results of the present study provide counterevidence to the claim that the ability to correctly reject ungrammatical sentences versus the ability to correctly accept grammatical sentences would be the key factor in determining whether the learners had in fact acquired the relevant properties. Our results show that subjects performed better at accepting grammatical sentences than at rejecting ungrammatical sentences. In addition, their performance was at a better than chance level, indicating that they were not merely guessing.

Birdsong (personal communication) disputes the claim that Universal Grammar may be at play in recognizing ungrammaticality by presenting the following counterarguments. First, it is argued that a closer examinations of the studies considered by Zobl (in press) does not reveal systematic learner performance. Besides, asymmetries in judgments for grammatical /ungrammatical items can be found for target language-specific properties where UG-based knowledge is irrelevant. Second, the use of linguists' determination of grammaticality as a starting point is unreliable due to differences of opinions among linguists and native speakers. Third, if UG was at play, all subjects, regardless of their level of proficiency in the second language, should be able to perform equally well on ungrammatical items. Besides, while attested asymmetries may be consistent with the domain-specific knowledge account, the same asymmetries are also consistent with domain-general accounts based on perception. Direct evidence may not be needed to determine whether an item is grammatical or ungrammatical.

Birdsong also rightly points out the danger of overgeneralizing from the results based on experimental performance. The subjects' performance may vary depending on the choice of the exemplars. Finally, if one were to take the asymmetry argument to a logical extreme, its shortcomings would become obvious: if some learners correctly rejected all ungrammatical items but failed to correctly accept all grammatical items, would that asymmetry be evidence that UG is available?

Two peripheral issues were related to the parameter resetting perspective. The first issue was the relationship between the level of proficiency and the performance of the subjects. The results of the grammaticality judgment task indicate that no significant difference was found among nonnative language groups for correctly rejecting ungrammatical sentences. If we accept the preceding claim according to which it is the metalinguistic ability to detect ungrammaticality which actually indicates whether the properties were acquired or not, we have to conclude that the performance of the subjects in this study did not significantly improve with the level of proficiency. All of the nonnative groups performed better than chance except for the S3000 group (66%). And the performance of the lowest level of proficiency (S2200 and F2200) was not statistically different from the performance of the advanced group. The results for correctly accepting grammatical sentences are just as puzzling: three significant groupings were found but once again, the level of performance did not improve with the level of proficiency. For instance, the performance of F4000 was significantly better than the performance of the SNS.

The second peripheral issue was the timing of the grammaticality judgment task. The results of the ANOVAs show that all groups took significantly more time to correctly accept grammatical sentences than to correctly reject ungrammatical sentences. Since, overall subjects performed better at accepting than rejecting sentences, we may say that they took longer to perform better. In other words, the timing results and the grammaticality judgment task results reveal the same consistency in rejecting sentences and variability in accepting sentences. There has been very little research up to now about the timing of grammaticality judgment tasks except for Cook 1989, 1990. So there are no theory-based predictions on timing and further research would be needed to elaborate any further.

Within the learnability perspective, it was hypothesized that the acquisitional sequence of the proposed properties will show that second language learners follow a learning principle such as the Subset principle (SP). It was argued that the results of the grammaticality judgment task showed that the subjects were guided by such a principle since they seemed to be acquiring some of the properties tested based on the positive evidence they were exposed to. However, it was also suggested that the SP as defined by Berwick (1985) would predict that, contrary to first language acquisition, second language learners would initially fail to reject ungrammatical sentences or fail to accept grammatical sentences for which they had not received positive evidence. That failure would lead to an overgeneralized grammar when the L1 was a superset of the L2. In other words, the learners would rely on the L1 structure by default. As Rutherford (1989) puts it:

> It would thus be strange indeed if the L2 learner did not tap as well his tacit knowledge of the intrinsic organization of at least one language in the world that he already knows - namely his mother tongue. This fact alone bears crucially upon the learnability issue for L2 vis-à-vis L1, and it is reflected in the small amount of research in this area that has emerged to date.
> (p.444-45)

This appeared to be the case since the subjects seemed to have transferred into the target language the dative alternation and dative passive structures used in the L1. Once again, contrary to first language acquisition, the second language learners would need direct or indirect negative evidence to learn that the target language generates only a subset of the properties allowed in the L1.

This account of the role of the L1 differs from the traditional accounts of language transfer. It is a principled account of language learning wherein what is usually called transfer, rather than being the driving force in acquisition, is more artifactual or epiphenomenal (Birdsong 1992, personal communication). Traditional accounts of transfer are based on behaviorism and led to Constrastive Analysis (Fries 1945, Lado 1957). That early approach to language learning claimed that L2 learning was similar to L1 learning in that it consisted of the learning of a fixed set of habits. It was argued that the second language learner would attempt to transfer his or her L1 linguistic habits to the L2. If the L1 and L2 match, positive transfer takes place. If the native language and the target language differ, there is a negative transfer of habits. This approach captured the role of the L1 in L2 acquisition but because it was limited to surface structure contrasts between the L1 and the L2, it could not reliably predict when transfer would actually occur. In contrast, hypotheses derived from learnability theory lead to specific proposals of L2 acquisition. The claims are precise and specific, and therefore testable.

In an attempt to demonstrate that the Subset Principle applies not only to first language acquisition, but also to second language acquisition, Berent 1991 reviews several studies, White 1989b, Zobl 1988, White 1989c (review of Finer and Broselow 1986, Finer 1989, Hirakawa 1989, Thomas 1989). He then proposes an alternative analysis or interpretation of the data which allows him to conclude that the SP is irrelevant to adjacency phenomena (White 1989b), the Configurationality parameter (Zobl 1988) or the Governing Category parameter (White 1989c). Finally, the Relative Clause

Parameter as formulated in Berent (1990) is described, the verification of the SP's learnability predictions for this parameter was discussed. A further reinterpretation of the results of studies on second language learners' acquisition of English relative clauses led to the conclusion that the Subset Principle does apply to second language acquisition. Berent (1991, p.18-19) concludes that:

> The identification and elaboration of principles and parameters of UG is still a relatively young enterprise which is constantly undergoing refinement. The exploration of these principles and parameters in SLA is an even younger enterprise. In this article, I hope to have demonstrated that possible manifestations of UG principles and parameters in SLA can be successfully investigated within the parametric theory of learnability developed in Wexler and Manzini (1987) and Manzini and Wexler (1987). Further research within this framework will hopefully lead to the identification of parameters to which the SP does and does not apply and to an understanding of the intricacies of parameter (re)setting in SLA. Such research may very well prove to be as valuable to linguistic theory generally as it is to SLA theory in particular.

Finally, the results of the second task, a correction task, indicate that overall, the French subjects were able to correct 78% of the sentences they correctly rejected and the Spanish subjects were able to correct 69% of the ungrammatical sentences they had rejected. In other words, we may say that 78% of the ungrammatical sentences rejected by the French subjects and 69% of the ungrammatical sentences rejected by the Spanish subjects, were correctly rejected because the relevant syntactic error was detected. Or it may be argued that some subjects correctly rejected ungrammatical sentences but lacked the metalinguistic sophistication to make the appropriate correction. It is reasonable to assume however, that subjects did not apply the relevant syntactic criteria in correctly rejecting the ungrammatical sentences when during the correction task the subjects chose to:

- indicate that a sentence was "correct as is" or,
- completely change the structure of some sentences. For example, a passive dative was rewritten as an active dative.

This time, the level of proficiency was not a better predictor of the level of performance, especially for the second language learners of French. And, as expected, the French and the Spanish native groups were able to correct almost all of the ungrammatical sentences they had rejected. Few studies use a correction task as was tested in the present study. It is suggested that a combination of correction task and think aloud procedures after a grammaticality judgment task, would provide some insights into the learners'grammatical competence.

Further research is needed to confirm or disconfirm the findings of this study which hopefully, constitutes a small contribution to the elaboration of a viable theory of second language acquisition based on linguistic theory within a generative framework.

APPENDIX A
RESULTS OF THE GRAMMATICALITY JUDGMENT TASK

Language versus group versus property

```
                  DF   F Value     Pr > F     r         % ACC Mean
                  39      7.63     0.0001     0.589          0.83
Course             7     18.91     0.0001
Property           4     20.52     0.0001
Group*Property    28      2.97     0.0001

REGWF Grouping                    Mean       N    Group
                      A           0.981      75   fns
            B         A           0.909      75   f4000
            B                     0.872      75   f3320
            B                     0.870      75   sns
            B                     0.845      75   f2200
                      C           0.730      75   s3300
                      C           0.729      75   s4000
                      C           0.713      75   s2200
-------------------------------------------------------------------
                  DF   F Value     Pr > F     r         % RJC Mean
                  39     12.38     0.0001     0.680          0.46
Group              7     12.82     0.0001
Property           4     75.66     0.0001
Group*Property    28      3.23     0.0001

REGWF Grouping                    Mean       N    Group
                      A           0.946      75   fns
                      A           0.890      75   sns
                      B           0.744      75   f4000
                      B           0.730      75   s2200
                      B           0.728      75   f2200
                      B           0.712      75   f3300
                      B           0.690      75   s4000
                      B           0.658      75   s3300
-------------------------------------------------------------------
                  DF   F Value     Pr > F     r         % ACC Mean
                   9     17.56     0.0001     0.459          0.84
Language           1     51.93     0.0001
Property           4     18.91     0.0001
Language*          4      7.62     0.0001
Property
```

```
REGWF Grouping                     Mean      N     LANGUAGE
                    A              0.902     300   french
                    B              0.779     300   spanish
REGWF Grouping                     Mean      N     Property
                    A              0.946     120   DA
                    B              0.878     120   DP
                    B              0.865     120   PSI
                    C              0.761     120   PSD
                    C              0.751     120   ECM

                        -----------PERC_ACC----------
Language     Property     N       Mean               SD
french       DA          60      0.980              0.060
french       DP          60      0.940              0.106
french       ECM         60      0.880              0.173
french       PSD         60      0.853              0.207
french       PSI         60      0.856              0.201
spanish      DA          60      0.913              0.153
spanish      DP          60      0.816              0.283
spanish      ECM         60      0.623              0.290
spanish      PSD         60      0.669              0.284
spanish      PSI         60      0.873              0.194
----------------------------------------------------------------
                   DF   F Value     Pr > F     r       % RJC Mean
                    9    27.77      0.0001    0.545         0.762
Language            1     3.24      0.0723
Property            4    60.95      0.0001
Language*           4     0.73      0.5738
Property

REGWF Grouping                     Mean      N     LANGUAGE
                    A              0.782     300   french
                    A              0.742     300   spanish
REGWF Grouping                     Mean      N     Property
                    A              0.963     120   PSI
                    A              0.910     120   PSD
                    B              0.805     120   ECM
                    C              0.640     120   DA
                    D              0.495     120   DP

                           -----------PERC_RJC----------
Language     Property     N       Mean               SD
french       DA          60      0.690              0.338
french       DP          60      0.516              0.349
french       ECM         60      0.833              0.250
french       PSD         60      0.913              0.181
french       PSI         60      0.960              0.102
spanish      DA          60      0.590              0.357
spanish      DP          60      0.473              0.370
spanish      ECM         60      0.776              0.280
spanish      PSD         60      0.906              0.206
spanish      PSI         60      0.966              0.105
```

F2200 Internal ANOVA

```
DF      F Value      Pr > F       r          PERC_ACC Mean
4        4.28        0.0037       0.443        0.84

REGWF Grouping                   Mean      N    Property
                    A            1.000     15   DA
          B         A            0.866     15   DP
          B         A            0.853     15   ECM
          B                      0.786     15   PSI
          B                      0.720     15   PSD

DF         F Value   Pr > F       r          PERC_RJC Mean
4           16.20    0.0001       0.693        0.728

REGWF Grouping                   Mean      N    Property
                    A            0.946     15   PSI
                    A            0.946     15   PSD
                    A            0.826     15   ECM
                    B            0.586     15   DA
                    C            0.333     15   DP
------------------------------------------------------------
```

F3300 Internal ANOVA

```
DF         F Value   Pr > F       r          PERC_ACC Mean
4           2.35     0.0627       0.344        0.87

REGWF Grouping                   Mean      N    Property
                    A            0.946     15   DA
                    A            0.933     15   DP
                    A            0.866     15   PSD
                    A            0.826     15   ECM
                    A            0.786     15   PSI

DF      F Value      Pr > F       r          PERC_RJC Mean
4        10.72       0.0001      0.616            0.71

REGWF Grouping                   Mean      N    Property
                    A             0.947    15   PSI
                    A             0.920    15   PSD
          B         A             0.733    15   ECM
          B         C             0.560    15   DA
                    C             0.400    15   DP
------------------------------------------------------------
```

F4000 Internal ANOVA

```
DF      F Value      Pr > F       r          PERC_ACC Mean
4         2.75        0.0345     0.36             0.91
```

```
REGWF Grouping                     Mean        N    Property
                     A             0.973       15   DA
          B          A             0.973       15   DP
          B          A             0.893       15   ECM
          B          A             0.853       15   PSI
          B                        0.853       15   PSD

DF        F Value    Pr > F        r           PERC_RJC Mean
4          13.20      0.0001        0.656            0.74

REGWF Grouping                     Mean        N    Property
                     A             0.960       15   PSI
                     A             0.893       15   PSD
          B          A             0.813       15   ECM
          B                        0.640       15   DA
                     C             0.413       15   DP
--------------------------------------------------------------
```

FNS Internal ANOVA

```
DF        F Value    Pr > F        r           PERC_ACC Mean
4          2.33      0.0641         0.343            0.98

REGWF Grouping                     Mean        N    Property
                     A             1.000       15   DA
                     A             1.000       15   PSI
                     A             0.986       15   DP
                     A             0.973       15   PSD
                     A             0.946       15   ECM

DF        F Value    Pr > F        r           PERC_RJC Mean
4          1.50      0.2109         0.281            0.946

REGWF Grouping                     Mean        N    Property
                     A             0.988       15   PSI
                     A             0.973       15   DA
                     A             0.960       15   ECM
                     A             0.920       15   DP
                     A             0.893       15   PSD
--------------------------------------------------------------
```

S2200 Internal ANOVA

```
DF        F Value    Pr > F        r           PERC_ACC Mean
4          2.81      0.0317         0.372            0.728

REGWF Grouping                     Mean        N    Property
                     A             0.920       15   DA
          B          A             0.773       15   PSI
          B          A             0.667       15   DP
          B          A             0.667       15   PSD
          B                        0.613       15   ECM
```

```
DF        F Value        Pr > F          r          PERC_RJC Mean
4          5.51          0.0006          0.489          0.73


REGWF Grouping                           Mean         N    Property
                      A                  0.960        15   PSI
             B        A                  0.800        15   PSD
             B        A      C           0.773        15   ECM
             B               C           0.600        15   DA
                             C           0.520        15   DP
-----------------------------------------------------------------------
```

S3300 Internal ANOVA

```
DF        F Value        Pr > F          r          PERC_ACC Mean
4          14.43         0.0001          0.672          0.75

REGWF Grouping                           Mean         N    Property
                      A                 0.933         15   DA
                      A                 0.883         15   DP
                      A                 0.866         15   PSI
                      B                 0.546         15   PSD
                      B                 0.520         15   ECM

DF        F Value        Pr > F          r          PERC_RJC Mean
4          20.74         0.0001          0.736          0.658

REGWF Grouping                          Mean        N      Property
                      A                 0.960         15   PSD
                      A                 0.960         15   PSI
                      B                 0.706         15   ECM
                      C                 0.333         15   DP
                      C                 0.333         15   DA
-----------------------------------------------------------------------
```

S4000 Internal ANOVA

```
DF        F Value        Pr > F          r          PERC_ACC Mean
4          4.73          0.0019          0.461          0.747

REGWF Grouping                           Mean         N    Property
                      A                  0.880        15   DA
                      A                  0.867        15   PSI
                      A                  0.817        15   DP
             B        A                  0.667        15   PSD
             B                           0.507        15   ECM

DF        F Value        Pr > F          r          PERC_RJC Mean
4          15.69         0.0001          0.687          0.69
```

```
REGWF Grouping                Mean      N    Property
                    A         0.946     15   PSD
                    A         0.946     15   PSI
                    B         0.720     15   ECM
                    C         0.480     15   DA
                    C         0.360     15   DP
```

SNS Internal ANOVA

```
DF     F Value    Pr > F      r        PERC_ACC Mean
4        3.50     0.0116     0.408         0.89

REGWF Grouping               Mean      N    Property
                    A        0.986     15   PSI
              B     A        0.920     15   DA
              B     A        0.900     15   DP
              B     A        0.853     15   ECM
              B              0.796     15   PSD

DF     F Value    Pr > F      r        PERC_RJC Mean
4        5.24     0.0009     0.480         0.89

REGWF Grouping                Mean      N    Property
                    A         1.000     15   PSI
                    A         0.946     15   DA
                    A         0.920     15   PSD
                    A         0.906     15   ECM
                    B         0.680     15   DP
```

APPENDIX B
RESULTS OF TIMING

```
----------------- CORRECTLY ACCEPT F2200 -----------------
REGWF Grouping               Mean       N    PROPERTY
                  A          8.371      54   PSD
         B        A          7.076      59   PSI
         B                   6.120      64   ECM
         B                   5.930      65   DP
         B                   5.559      75   DA

----------------- CORRECTLY ACCEPT F 3300 ----------------
REGWF Grouping               Mean       N    PROPERTY
                  A          5.445      62   ECM
                  A          5.237      65   PSD
                  A          5.001      70   DP
                  A          4.313      59   PSI
                  A          4.059      71   DA

----------------- CORRECTLY ACCEPT  F4000 ----------------
REGWF Grouping               Mean       N    PROPERTY
                  A          5.785      73   DP
                  A          4.975      73   DA
                  A          4.916      67   ECM
                  A          4.695      64   PSD
                  A          4.422      64   PSI

----------------- CORRECTLY ACCEPT FNS -------------------
REGWF Grouping               Mean       N   PROPERTY
                  A          5.100      71   ECM
         B        A          4.773      74   DP
         B        A          4.383      73   PSD
         B                   3.582      75   DA
         B                   3.431      75   PSI

----------------- CORRECTLY ACCEPT S2200 -----------------
REGWF Grouping               Mean       N    PROPERTY
                  A          7.381      46   ECM
                  A          7.194      50   PSD
         B        A          5.866      69   DA
         B                   4.693      40   DP
         B                   4.567      58   PSI
```

```
----------------- CORRECTLY ACCEPT S3300 -----------------
REGWF Grouping                  Mean      N   PROPERTY
                  A             7.546     39  ECM
          B       A             6.326     70  DA
          B       A   C         5.782     41  PSD
          B           C         5.361     53  DP
                      C         3.917     65  PSI

----------------- CORRECTLY ACCEPT S4000 -----------------
REGWF Grouping                  Mean      N   PROPERTY
                  A             7.631     38  ECM
          B       A             5.944     66  DA
          B                     5.563     50  PSD
          B                     5.015     49  DP
          B                     4.035     65  PSI

----------------- CORRECTLY ACCEPT SNS -------------------
REGWF Grouping                  Mean      N   PROPERTY
                  A             4.510     69  DA
                  A             4.281     64  ECM
                  A             3.802     60  PSD
                  A             3.728     54  DP
                  A             3.189     74  PSI

----------------- CORRECTLY REJECT F2200 -----------------
REGWF Grouping                  Mean      N  PROPERTY
                  A             8.763     25  DP
          B       A             6.890     44  DA
          B       C             5.775     62  ECM
          B       C             4.299     71  PSD
                  C             4.272     71  PSI

----------------- CORRECTLY REJECT F3300 -----------------
REGWF Grouping                  Mean      N   PROPERTY
                  A             5.362     30  DP
          B       A             5.221     42  DA
          B       A   C         4.420     55  ECM
          B           C         3.897     71  PSI
                      C         3.552     69  PSD

----------------- CORRECTLY REJECT F4000 -----------------
REGWF Grouping                  Mean      N   PROPERTY
                  A             5.903     48  DA
                  A             5.407     61  ECM
                  A             5.334     31  DP
                  B             3.771     67  PSD
                  B             3.605     72  PSI
```

```
----------------- CORRECTLY  REJECT  FNS -------------------
REGWF Grouping                  Mean       N    PROPERTY
                      A         4.315      72   ECM
                      A         4.219      69   DP
                      A         3.948      73   DA
                      A         3.936      67   PSD
                      A         3.835      74   PSI

----------------- CORRECTLY  REJECT  S2200 -----------------
REGWF Grouping                  Mean       N    PROPERTY
                      A         6.622      39   DP
                      A         6.352      45   DA
            B         A         5.417      58   ECM
            B         A         5.111      60   PSD
            B                   3.980      72   PSI

----------------- CORRECTLY  REJECT  S3300 -----------------
REGWF Grouping                  Mean       N    PROPERTY
                      A         6.948      53   ECM
            B         A         6.190      25   DP
            B         A         5.126      25   DA
            B                   4.358      72   PSD
            B                   4.141      72   PSI

----------------  CORRECTLY  REJECT  S4000  ----------------
REGWF Grouping                  Mean       N    PROPERTY
                      A         8.019      27   DP
            B         A         6.388      54   ECM
            B         C         5.529      36   DA
            B         C         4.034      71   PSD
                      C         3.999      71   PSI

----------------- CORRECTLY  REJECT  SNS -------------------
REGWF Grouping                  Mean       N    PROPERTY
                      A         5.164      68   ECM
            B         A         4.282      51   DP
            B         A         4.237      71   DA
            B         A         2.955      75   PSI
            B                   2.615      69   PSD

--------------------- CORRECTLY  ACCEPT --------------------
REGWF Grouping             Mean      N    LANGUAGE
                      A    5.168   1120    span
                      A    5.095   1353    french

--------------------- CORRECTLY REJECT -------------------
REGWF Grouping             Mean      N    LANGUAGE
                      A    4.774   1114   span
                      A    4.567   1174   french
```

```
--------------------- CORRECTLY ACCEPT -------------------
REGWF Grouping                  Mean      N   GROUP
                  A             6.510    317  F2200
          B       A             5.919    263  S2200
          B       A   C         5.645    268  S3300
          B           C         5.479    268  S4000
          B       D   C         4.980    341  F4000
                  D   C         4.803    327  F3300
          E       D             4.242    368  FNS
          E                     3.896    321  SNS

--------------------- CORRECTLY REJECT -------------------
REGWF Grouping                   Mean      N  GROUP
                  A             5.453    273  F2201
                  A             5.298    274  S2201
          B       A             5.139    259  S4000
          B       A             5.114    247  S3300
          B       A   C         4.626    279  F4000
          B           C         4.289    267  F3320
                      C         4.049    355  FNS
                      C         3.809    334  SNS

-------------- CORRECTLY ACCEPT - PSI --------------------
REGWF Grouping              Mean      N  LANGUAGE
                  A         4.717    257  french
                  B         3.885    262  spanish

-------------- CORRECTLY ACCEPT - PSD --------------------
REGWF Grouping              Mean      N  LANGUAGE
                  A         5.519    256  french
                  A         5.488    201  spanish

-------------- CORRECTLY ACCEPT - ECM --------------------
REGWF Grouping              Mean      N  LANGUAGE
                  A         6.405    187  spanish
                  B         5.381    264  french

-------------- CORRECTLY ACCEPT - DA ---------------------
REGWF Grouping              Mean      N  LANGUAGE
                  A         5.661    274  spanish
                  B         4.547    294  french

-------------- CORRECTLY ACCEPT - DP ---------------------
REGWF Grouping              Mean      N  LANGUAGE
                  A         5.358    282  french
                  B         4.688    196  spanish

-------------- CORRECTLY REJECT PSI ----------------------
REGWF Grouping              Mean      N  LANGUAGE
                  A         3.900    288  french
                  A         3.760    290  spanish
```

```
-------------- CORRECTLY REJECT - PSD --------------------
REGWF Grouping               Mean       N  LANGUAGE
                    A        3.997    272   spanish
                    A        3.893    274   french

-------------- CORRECTLY REJECT - ECM -------------------
REGWF Grouping               Mean       N  LANGUAGE
                    A        5.916    233   spanish
                    A        4.967    250   french

-------------- CORRECTLY REJECT - DA --------------------
REGWF Grouping               Mean       N  LANGUAGE
                    A        5.285    207   french
                    A        5.163    177   spanish

-------------- CORRECTLY REJECT - DP --------------------
REGWF Grouping               Mean       N  LANGUAGE
                    A        5.971    142   spanish
                    A        5.396    155   french

---------------------- F2200 ----------------------------
REGWF Grouping               Mean       N   PROPERTY
                    A        6.717     90   DP
                    A        6.058    125   PSD
                    A        6.051    119   DA
                    A        5.950    126   ECM
                    A        5.545    130   PSI

---------------------- F3300 ---------------------------
REGWF Grouping               Mean       N   PROPERTY
                    A        5.109    100   DP
                    A        4.963    117   ECM
                    A        4.491    113   DA
                    A        4.369    134   PSD
                    A        4.086    130   PSI

---------------------- F4000 ----------------------------
REGWF Grouping               Mean       N    PROPERTY
                    A         5.650    104   DP
              B     A         5.343    121   DA
              B     A   C     5.150    128   ECM
              B         C     4.223    131   PSD
                        C     3.990    136   PSI

---------------------- FNS -----------------------------
REGWF Grouping               Mean       N   PROPERTY
                    A        4.705    143   ECM
              B     A        4.506    143   DP
              B     A        4.169    140   PSD
              B     A        3.762    148   DA
              B              3.632    149   PSI
```

```
---------------------- S2200 -----------------------------
REGWF Grouping              Mean       N  PROPERTY
                  A         6.286    104  ECM
                  A         6.058    114  DA
                  A         6.058    110  PSD
                  A         5.645     79  DP
                  B         4.242    130  PSI

---------------------- S3300 -----------------------------
REGWF Grouping              Mean       N  PROPERTY
                  A         7.201     92  ECM
          B       A         6.010     95  DA
          B                 5.627     78  DP
          B       C         4.874    113  PSD
                  C         4.035    137  PSI

---------------------- S4000 -----------------------------
REGWF Grouping              Mean       N  PROPERTY
                  A         6.902     92  ECM
          B       A         6.082     76  DP
          B       A         5.797    102  DA
          B       C         4.666    121  PSD
                  C         4.016    136  PSI

---------------------- SNS -------------------------------
REGWF Grouping              Mean       N  PROPERTY
                  A         4.736    132  ECM
          B       A         4.371    140  DA
          B       A   C     3.997    105  DP
          B           C     3.167    129  PSD
                      C     3.071    149  PSI

---------------------- F2200 -----------------------------
REGWF Grouping                 Mean       N  INCLINAT
                  A            6.510    317   accept
                  B            5.453    273   reject

---------------------- F3300 -----------------------------
REGWF Grouping                 Mean       N  INCLINAT
                  A            4.803    327   accept
                  A            4.289    267   reject

---------------------- F4000 -----------------------------
REGWF Grouping                 Mean       N  INCLINAT
                  A            4.980    341   accept
                  A            4.626    279   reject

---------------------- FNS -------------------------------
REGWF Grouping                 Mean       N  INCLINAT
                  A            4.242    368   accept
                  A            4.049    355   reject
```

```
---------------------- S2200 -----------------------------
REGWF Grouping                   Mean       N  INCLINAT
                  A              5.919    263   accept
                  A              5.298    274   reject

---------------------- S3300 -----------------------------
REGWF Grouping                   Mean       N  INCLINAT
                  A              5.645    268   accept
                  A              5.114    247   reject

---------------------- S4000 -----------------------------
REGWF Grouping                   Mean       N  INCLINAT
                  A              5.479    268   accept
                  A              5.139    259   reject

---------------------- SNS -------------------------------
REGWF Grouping                   Mean       N  INCLINAT
                  A              3.896    321   accept
                  A              3.809    334   reject
----------------------------------------------------------
```

APPENDIX C
ITEM FREQUENCY ANALYSIS

I - French - Incorrectly rejected

SID	UR	%	F2200	F3300	F4000	FNS	ST
17	13	22%	9 60%	1 7%	3 20%	0 0%	PSD
27	12	20%	3 20%	3 20%	2 13%	4 27%	ECM
10	11	18%	3 20%	6 40%	2 13%	0 0%	PSI
18	10	17%	3 20%	4 27%	3 20%	0 0%	PSD
9	9	15%	4 27%	3 20%	2 13%	0 0%	PSI
6	9	15%	3 20%	2 13%	4 27%	0 0%	PSI
7	8	13%	3 20%	3 20%	2 13%	0 0%	PSI
29	8	13%	3 20%	4 27%	1 7%	0 0%	ECM
16	8	13%	5 33%	2 13%	1 7%	0 0%	PSD
20	8	13%	1 7%	1 7%	4 27%	2 13%	PSD
28	7	12%	2 13%	2 13%	3 20%	0 0%	ECM
8	6	10%	3 20%	2 13%	1 7%	0 0%	PSI
26	6	10%	1 7%	3 20%	2 13%	0 0%	ECM
47	6	10%	3 20%	2 13%	0 0%	1 7%	DP
50	6	10%	3 20%	2 13%	1 7%	0 0%	DP
19	5	8%	3 20%	2 13%	0 0%	0 0%	PSD
30	3	5%	2 13%	1 7%	0 0%	0 0%	ECM
39	3	5%	0 0%	1 7%	2 13%	0 0%	DA
49	3	5%	3 20%	0 0%	0 0%	0 0%	DP
48	2	3%	1 7%	1 7%	0 0%	0 0%	DP
36	1	2%	0 0%	1 7%	0 0%	0 0%	DA
37	1	2%	0 0%	1 7%	0 0%	0 0%	DA
40	1	2%	0 0%	1 7%	0 0%	0 0%	DA
46	1	2%	0 0%	0 0%	1 7%	0 0%	DP
38	0	0%	0 0%	0 0%	0 0%	0 0%	DA

II - French - Incorrectly accepted

SID	UA	%	F2200	F3300	F4000	FNS	ST
45	36	60%	13 87%	11 73%	11 73%	1 7%	DP
41	35	58%	11 73%	11 73%	12 80%	0 0%	DP
43	33	55%	10 67%	12 80%	10 67%	1 7%	DP
35	27	45%	9 60%	9 60%	9 60%	0 0%	DA
31	23	38%	9 60%	8 53%	4 27%	2 13%	DA
42	21	35%	10 67%	5 33%	4 27%	2 13%	DP
44	20	33%	6 40%	6 40%	2 13%	1 7%	DP
33	19	32%	6 40%	6 40%	7 47%	0 0%	DA

23	16	27%	4	27%	7	47%	4	27%	1	7%	ECM
25	14	23%	6	40%	4	27%	4	27%	0	0%	ECM
34	14	23%	3	20%	6	40%	5	33%	0	0%	DA
32	10	17%	4	27%	4	27%	2	13%	0	0%	DA
21	10	17%	2	13%	5	33%	2	13%	1	7%	ECM
11	7	12%	1	7%	2	13%	4	27%	0	0%	PSD
13	7	12%	2	13%	1	7%	1	7%	3	20%	PSD
12	6	10%	1	7%	1	7%	0	0%	4	27%	PSD
22	5	8%	2	13%	2	13%	2	13%	1	7%	ECM
24	5	8%	1	7%	2	13%	2	13%	0	0%	ECM
4	4	7%	1	7%	1	7%	2	13%	0	0%	PSI
15	4	7%	0	0%	0	0%	3	20%	1	7%	PSD
2	3	5%	1	7%	2	13%	0	0%	0	0%	PSI
1	2	3%	1	7%	0	0%	0	0%	1	7%	PSI
5	2	3%	1	7%	1	7%	0	0%	0	0%	PSI
14	2	3%	0	0%	2	13%	0	0%	0	0%	PSD
3	1	2%	0	0%	0	0%	1	7%	0	0%	PSI

III - French - Correctly accepted

SID	CA	%	F2200		F3300		F4000		FNS		ST
38	60	100%	15	100%	15	100%	15	100%	15	100%	DA
36	59	98%	15	100%	14	93%	15	100%	15	100%	DA
37	59	98%	15	100%	14	93%	15	100%	15	100%	DA
40	59	98%	15	100%	14	93%	15	100%	15	100%	DP
46	59	98%	15	100%	15	100%	14	93%	15	100%	DP
48	58	97%	14	93%	14	93%	15	100%	15	100%	DP
49	57	95%	12	80%	15	100%	15	100%	15	100%	DP
39	57	95%	15	100%	14	93%	13	87%	15	100%	DA
30	57	95%	13	87%	14	93%	15	100%	15	100%	DA
19	55	92%	12	80%	13	87%	15	100%	15	100%	PSD
8	54	90%	12	80%	13	87%	14	93%	15	100%	PSI
26	54	90%	14	93%	12	80%	13	87%	15	100%	ECM
47	54	90%	12	80%	13	87%	15	100%	14	93%	DP
50	54	90%	12	80%	13	87%	14	93%	15	100%	DP
28	53	88%	13	87%	13	87%	12	80%	15	100%	ECM
20	52	87%	14	93%	14	93%	11	73%	13	87%	ECM
29	52	87%	12	80%	11	73%	14	93%	15	100%	ECM
7	52	87%	12	80%	12	80%	13	87%	15	100%	PSI
16	52	87%	10	67%	13	87%	14	93%	15	100%	PSD
6	51	85%	12	80%	13	87%	11	73%	15	100%	PSI
9	51	85%	11	73%	12	80%	13	87%	15	100%	PSI
18	50	83%	12	80%	11	73%	12	80%	15	100%	PSD
10	49	82%	12	80%	9	60%	13	87%	15	100%	PSI
27	48	80%	12	80%	12	80%	13	87%	11	73%	ECM
17	47	78%	6	40%	14	93%	12	80%	15	100%	PSD

IV - French - Correctly rejected

SID	CR	%	F2200		F3300		F4000		FNS		ST
3	59	98%	15	100%	15	100%	14	93%	15	100%	PSI
1	58	97%	14	93%	15	100%	15	100%	14	93%	PSI
5	58	97%	14	93%	14	93%	15	100%	15	100%	PSI
14	58	97%	15	100%	13	87%	15	100%	15	100%	PSD
2	57	95%	14	93%	13	87%	15	100%	15	100%	PSI
15	56	93%	15	100%	15	100%	12	80%	14	93%	PSD
4	56	93%	14	93%	14	93%	13	87%	15	100%	PSI
22	55	92%	15	100%	13	87%	13	87%	14	93%	ECM
24	55	92%	14	93%	13	87%	13	87%	15	100%	ECM
12	54	90%	14	93%	14	93%	15	100%	11	73%	PSD
13	53	88%	13	87%	14	93%	14	93%	12	80%	PSD
11	53	88%	14	93%	13	87%	11	73%	15	100%	PSD
21	50	83%	13	87%	10	67%	13	87%	14	93%	ECM
32	50	83%	11	73%	11	73%	13	87%	15	100%	DA
33	41	68%	9	60%	9	60%	8	53%	15	100%	DA
44	40	67%	9	60%	9	60%	8	53%	14	93%	DP
42	39	65%	5	33%	10	67%	11	73%	13	87%	DP
31	37	62%	6	40%	7	47%	11	73%	13	87%	DA
35	33	55%	6	40%	6	40%	6	40%	15	100%	DA
43	27	45%	5	33%	3	20%	5	33%	14	93%	DP
41	25	42%	4	27%	4	27%	3	20%	14	93%	DP
45	24	40%	2	13%	4	27%	4	27%	14	93%	DP

V - Spanish - Incorrectly rejected

SID	UR	%	S2200		S3300		S4000		SNS		ST
17	32	53%	7	47%	7	47%	8	53%	10	67%	PSD
26	29	48%	6	40%	11	73%	8	53%	4	27%	ECM
27	29	48%	7	47%	9	60%	9	60%	4	27%	ECM
28	26	43%	6	40%	8	53%	10	67%	2	13%	ECM
19	21	35%	6	40%	8	53%	4	27%	3	20%	PSD
18	17	28%	5	33%	6	40%	6	40%	0	0%	PSD
16	17	28%	4	27%	8	53%	4	27%	1	7%	PSD
29	16	27%	5	33%	4	27%	6	40%	1	7%	ECM
30	13	22%	5	33%	4	27%	4	27%	0	0%	ECM
47	12	20%	5	33%	3	20%	4	27%	0	0%	DP
48	12	20%	6	40%	0	0%	3	20%	3	20%	DP
20	12	20%	3	20%	5	33%	3	20%	1	7%	PSD
8	10	17%	7	47%	2	13%	1	7%	0	0%	PSI
37	9	15%	2	13%	3	20%	2	13%	2	13%	DA
10	8	13%	3	20%	1	7%	4	27%	0	0%	PSI
7	8	13%	3	20%	3	20%	2	13%	0	0%	PSI
6	6	10%	2	13%	2	13%	2	13%	0	0%	PSI
9	6	10%	2	13%	2	13%	1	7%	1	7%	PSI
36	6	10%	3	20%	1	7%	1	7%	1	7%	DA
49	6	10%	5	33%	0	0%	0	0%	1	7%	DP
39	4	7%	0	0%	0	0%	3	20%	1	7%	DA
40	4	7%	1	7%	0	0%	2	13%	1	7%	DA

46	4	7%	4	27%	4	27%	4	27%	2	13%	DP
38	3	5%	0	0%	1	7%	1	7%	1	7%	DA

VI - Spanish - Incorrectly accepted

SID	UA	%	S2200		S3300		S4000		SNS		ST
41	36	60%	9	60%	10	73%	11	73%	6	40%	DP
43	34	57%	7	47%	12	80%	11	73%	4	27%	DP
45	34	57%	7	47%	10	67%	9	60%	8	53%	DP
32	31	52%	7	47%	13	87%	10	67%	1	7%	DA
44	30	50%	9	60%	9	60%	8	53%	4	27%	DP
33	28	47%	10	67%	9	60%	8	53%	1	7%	DA
35	26	43%	6	40%	10	67%	9	60%	1	7%	DA
23	25	42%	8	53%	7	47%	7	47%	3	20%	ECM
42	24	40%	4	27%	9	60%	9	60%	2	13%	DP
31	20	33%	5	53%	9	60%	6	40%	0	0%	DA
34	18	30%	2	13%	9	60%	6	40%	1	7%	DA
22	16	27%	4	27%	5	33%	5	33%	2	13%	ECM
25	11	18%	1	7%	5	33%	4	27%	1	7%	ECM
21	8	13%	3	20%	2	13%	3	20%	0	0%	ECM
12	8	13%	5	53%	0	0%	1	7%	2	13%	PSD
24	7	12%	1	7%	3	20%	2	13%	1	7%	ECM
11	5	8%	4	27%	0	0%	0	0%	1	7%	PSD
13	5	8%	2	13%	1	7%	1	7%	1	7%	PSD
14	5	8%	3	20%	1	7%	0	0%	1	7%	PSD
15	5	8%	1	7%	1	7%	2	13%	1	7%	PSD
2	4	7%	1	7%	2	13%	1	7%	0	0%	PSI
3	2	3%	1	7%	0	0%	1	7%	0	0%	PSI
5	2	3%	0	0%	1	7%	1	7%	0	0%	PSI
1	1	2%	1	7%	0	0%	0	0%	0	0%	PSI
4	1	2%	0	0%	0	0%	1	7%	0	0%	PSI

VII - Spanish - Correctly accepted

SID	CA	%	S2200		S3300		S4000		SNS		ST
38	57	95%	15	100%	14	93%	14	93%	14	93%	DA
39	56	93%	15	100%	15	100%	12	80%	14	93%	DA
40	56	93%	14	93%	15	100%	13	87%	14	93%	DA
36	54	90%	12	80%	14	93%	14	93%	14	93%	DA
49	54	90%	10	67%	15	100%	15	100%	14	93%	DP
6	54	90%	13	87%	13	87%	13	87%	15	100%	PSI
9	54	90%	13	87%	13	87%	14	93%	14	93%	PSI
7	52	87%	12	80%	12	80%	13	87%	15	100%	PSI
10	52	87%	12	80%	14	93%	11	73%	15	100%	PSI
37	51	85%	13	87%	12	80%	13	87%	13	87%	DA
8	50	83%	8	53%	13	87%	14	93%	15	100%	PSI
20	48	80%	12	80%	10	67%	12	80%	14	93%	PSD
47	48	80%	10	67%	12	80%	11	73%	15	100%	DP
48	48	80%	9	60%	15	100%	12	80%	12	80%	DP

30	47	78%	10	67%	11	73%	11	73%	15	100%	ECM
46	46	77%	11	73%	11	73%	11	73%	13	87%	DP
29	44	73%	10	67%	11	73%	9	60%	14	93%	ECM
16	43	72%	11	73%	7	47%	11	73%	14	93%	PSD
18	43	72%	10	67%	9	60%	9	60%	15	100%	PSD
19	39	65%	9	60%	7	47%	11	73%	12	80%	PSD
28	34	57%	9	60%	7	47%	5	33%	13	87%	ECM
26	31	52%	9	60%	4	27%	7	47%	11	73%	ECM
27	31	52%	8	53%	6	40%	6	40%	11	73%	ECM
17	28	47%	8	53%	8	53%	7	47%	5	33%	PSD

VIII - Spanish - Correctly rejected

SID	CR	%	S2200		S3300		S4000		SNS		ST
1	59	98%	14	93%	15	100%	15	100%	15	100%	PSI
4	59	98%	15	100%	15	100%	14	93%	15	100%	PSI
3	58	97%	14	93%	15	100%	14	93%	15	100%	PSI
5	58	97%	15	100%	14	93%	14	93%	15	100%	PSI
2	56	93%	14	93%	13	87%	14	93%	15	100%	PSI
11	55	92%	11	73%	15	100%	15	100%	14	93%	PSD
13	55	92%	13	87%	14	93%	14	93%	14	93%	PSD
14	55	92%	12	80%	14	93%	15	100%	14	93%	PSD
15	55	92%	14	93%	14	93%	13	87%	14	93%	PSD
24	53	88%	14	93%	12	80%	13	87%	14	93%	ECM
21	52	87%	12	80%	13	87%	12	80%	15	100%	ECM
12	52	87%	10	67%	15	100%	14	93%	13	87%	PSD
25	49	82%	14	93%	10	67%	11	73%	14	93%	ECM
22	44	73%	11	73%	10	67%	10	67%	13	87%	ECM
34	42	70%	13	87%	6	40%	9	60%	14	93%	DA
31	40	67%	10	67%	6	40%	9	60%	15	100%	DA
42	36	60%	11	73%	6	40%	6	40%	13	87%	DP
35	34	57%	9	60%	5	33%	6	40%	14	93%	DA
33	32	29%	5	33%	6	40%	7	47%	14	93%	DA
44	30	50%	6	40%	6	40%	7	47%	11	73%	DP
32	29	48%	8	53%	2	13%	5	33%	14	93%	DA
45	26	43%	8	53%	5	33%	6	40%	7	47%	DP
43	26	43%	8	53%	3	20%	4	27%	11	73%	DP
41	24	40%	6	40%	5	33%	4	27%	9	60%	DP

APPENDIX D
BACKGROUND DATA QUESTIONNAIRE

The following information will remain strictly confidential and will only be used anonymously in data analyses.

1 - NAME : ______________________________

2 - AGE : __________

3 - NATIVE LANGUAGE : __________________________

4 - SECOND LANGUAGE : __________________________

5 - THIRD LANGUAGE : __________________________

6 - SPANISH COURSES TAKEN :

Please specify whether you took the course over a semester or a quarter as well as the credit hours; and give the approximate dates at which you took the course.

Highschool:

____

____

____

College/University:

____

____

____

7 - LENGTH OF STAY(S) IN SPAIN OR ANY SPANISH-SPEAKING COUNTRY:
(Please specify the number of weeks/months and the country in which you stayed)

____

____

____

II - SELF-ASSESSMENT

1 - Please rate yourself on a scale from 1 to 10 in your ability in Spanish :

PRONUNCIATION :

Least native like	1	2	3	4	5	6	7	8	9	10	Most native like

GRAMMAR :

Least native like	1	2	3	4	5	6	7	8	9	10	Most native like

VOCABULARY :

Least native like	1	2	3	4	5	6	7	8	9	10	Most native like

2 - How motivated are you to learn Spanish ?

Not at all motivated	1	2	3	4	5	6	7	8	9	10	Extremely Motiv.

3 - Do you enjoy learning Spanish ?

Do not enjoy at all	1	2	3	4	5	6	7	8	9	10	Enjoy a great deal

4 - How is your general image of Spanish people ?

Very negative	1	2	3	4	5	6	7	8	9	10	Very positive

NATIVE SPEAKERS' BACKGROUND DATA

The following information will remain strictly confidential and will only be used anonymously in data analyses.

NAME : ______________________________

AGE : ______________

PLACE OF BIRTH : ________________________

NATIVE LANGUAGE : _______________________

SECOND LANGUAGE : _______________________

Were you exposed to it formally or naturalistically? :

____

If formal :
How many years of formal instruction do you have :__________

And at what age did you start ?:_______________________

If naturalistic. At what age did you start?_______________

THIRD LANGUAGE : ________________________

Level of Proficiency :_________________________________

LENGTH OF RESIDENCE IN THE USA :_______________________

How old were you when you first came to the USA ?:__________

1 - How often do you go to your native country?

____

2 - How long do you usually stay?

____

3 - What is the language you speak the most often at home here in the USA?

____

4 - Do you consider yourself to be a bilingual? What is your predominant language?

____

APPENDIX E
BACKGROUND DATA ANALYSIS

No correlation between performance and any background information was found for nonnative or for native speakers.

TL = third language
AA = age of arrival
LR = length of residence
NE = naturalistic exposure (y=yes, n=no)
FE = formal exposure (y=yes, n=no)
BE = both exposures
YFE = years of formal exposure
SAE = starting age of exposure
MLH = main language spoken at home
BL = bilingual
PL = predominant language
S = sex
AC = % for accepting
RJ = % for rejecting

	AGE	TL	AA	LR	NE	FE	BE	YFE	SAE	MLH	BL	PL	S	AC	RJ
FNS1	24	S	20	4	N	Y	N	8	12	E	Y	F	M	100	88
FNS2	34	S	28	6	N	Y	N	7	12	E	Y	B	F	100	100
FNS3	25	G	23	2	N	Y	N	10	7	F	Y	F	F	96	100
FNS4	39	S	22	8	N	Y	N	10	11	F	Y	B	F	96	96
FNS5	35	S	23	12	N	N	Y	10	1	E	Y	F	F	100	96
FNS6	25	G	24	1	N	Y	N	8	14	E	N	F	F	100	100
FNS7	28	S	11	10	N	N	Y	10	12	B	Y	F	F	92	100
FNS8	32	S	19	13	N	N	Y	2	16	B	Y	B	F	100	100
FNS9	26	-	26	0	N	Y	N	9	10	E	Y	F	M	96	68
FNS10	28	G	15	2	N	N	Y	9	12	E	Y	F	M	96	100
FNS11	23	S	18	5	N	Y	N	12	11	F	Y	F	F	100	100
FNS12	25	G	18	1	N	Y	N	11	11	B	Y	F	M	100	96
FNS13	22	S	19	3	N	Y	N	7	12	E	Y	F	F	96	88
FNS14	22	S	17	6	N	Y	N	8	12	B	Y	F	M	100	88
FNS15	29	-	27	2	N	Y	N	7	12	F	N	F	F	100	100
SNS1	38	P	32	6	N	N	Y	10	20	S	N	S	F	90	86
SNS2	42	F	13	20	N	N	Y	20	20	E	Y	E	F	90	82
SNS3	29	-	21	6	Y	N	N	0	-	S	Y	B	F	94	94
SNS4	35	P	28	7	N	Y	N	16	6	E	Y	S	F	94	98
SNS5	36	F	31	5	N	Y	N	17	6	S	Y	B	F	77	100

SNS6	19	F	7	12	Y	N	N	0	-	S	Y	B	F	82	98
SNS7	27	P	17	10	N	Y	N	5	10	E	Y	B	F	94	100
SNS8	18	F	4	14	N	Y	N	5	10	S	Y	S	F	94	53
SNS9	21	F	19	2	N	N	Y	11	5	E	Y	S	F	92	87
SNS10	35	F	32	3	N	Y	N	8	7	S	Y	S	F	86	98
SNS11	26	F	20	6	N	N	Y	11	8	B	Y	S	M	90	94
SNS12	23	-	12	11	N	N	Y	11	12	S	Y	B	M	82	100
SNS13	23	F	2	21	N	Y	N	15	6	S	Y	B	M	90	98
SNS14	22	F	1	21	N	N	Y	18	5	B	Y	E	M	77	94
SNS15	21	F	1	20	N	N	Y	14	5	S	Y	B	F	77	77

TL = third language
HC = highschool (years of study)
UC = university/college (years of study)
S = sex
P = pronounciation
G = grammar
V = vocabulary
AV1 = average of pronounciation, vocabulary and grammar
M = motivation
E = enjoyment
I = image
AV2 = average for motivation, enjoyment and image
AC = percentage on accepting
RJ = percentage on rejecting

S2200	AGE	TL	HC	UC	S	P	G	V	AV1	M	E	I	AV2	AC	RJ
S1	21	-	4	2	M	5	8	4	6	10	10	10	10	61	94
S1	22	-	2	2	F	5	8	8	7	9	10	10	10	77	65
S3	20	-	4	2	F	7	5	6	6	8	8	10	9	86	53
S4	20	-	2	2	F	4	4	2	3	6	7	9	7	69	61
S5	21	-	4	2	F	5	7	5	6	10	10	10	10	69	86
S6	19	-	2	2	F	8	8	5	7	8	10	7	8	69	94
S7	20	-	4	2	F	3	5	3	4	9	9	7	8	61	77
S8	20	-	0	2	F	5	6	5	5	8	8	6	7	49	73
S9	18	-	4	2	F	8	6	7	7	10	10	10	10	57	69
S10	21	-	0	2	F	6	5	4	5	8	8	10	9	77	82
S11	17	-	0	2	F	6	5	7	6	8	8	10	9	86	69
S12	20	-	3	2	F	6	4	4	5	9	9	9	9	86	69
S13	20	-	2	2	M	3	4	4	4	7	7	8	7	65	65
S14	18	-	2	2	F	5	6	5	5	9	9	9	9	90	77
S15	21	F	2	2	F	7	5	5	6	10	10	10	10	69	82

S3300	AGE	TL	HC	UC	S	P	G	V	AV1	M	E	I	AV2	AC	RJ
S1	24	F	3	3	M	3	4	3	3	9	9	8	9	65	61
S2	20	F	3	3	F	8	3	5	5	10	9	10	10	77	53
S3	20	-	3	3	F	8	6	6	7	9	9	9	9	65	57
S4	19	-	3	3	F	7	6	6	6	8	10	9	9	86	86
S5	17	-	3	1	M	5	8	7	7	9	9	9	9	65	57

S6	21	-	4	3	M	7	5	6	6	9	9	9	9	69	69
S7	19	-	4	3	M	6	5	5	5	9	9	9	9	73	82
S8	19	-	5	3	F	8	7	5	7	7	8	7	7	86	49
S9	19	-	2	3	M	3	4	4	4	10	8	10	9	82	57
S10	20	-	4	3	F	6	4	4	5	10	10	9	10	73	67
S11	21	-	4	3	M	6	4	5	5	8	8	10	9	73	73
S12	21	-	3	3	M	7	6	5	6	8	10	8	9	65	82
S13	24	P	2	3	M	8	7	5	7	9	10	10	10	82	69
S14	20	-	2	3	F	2	3	2	2	6	8	8	7	57	41
S15	20	-	4	3	F	7	5	5	6	9	9	8	9	61	98

S4000	AGE	TL	HC	UC	S	P	G	V	AV1	M	E	I	AV2	AC	RJ
S1	21	-	4	3	F	6	5	6	6	8	9	9	9	73	65
S2	22	-	4	4	F	7	7	5	6	10	9	10	10	94	57
S3	20	-	4	1	F	8	7	7	7	9	9	9	9	86	86
S4	19	F	0	3	F	10	7	8	8	10	10	10	10	98	65
S5	22	-	4	4	F	8	5	7	7	10	10	10	10	90	73
S6	20	-	4	3	F	8	4	5	6	10	10	6	9	77	82
S7	18	-	4	2	M	5	5	6	5	8	10	9	9	65	82
S8	23	-	4	3	M	8	7	7	7	9	8	9	9	65	49
S9	20	F	4	3	F	9	6	8	8	9	8	10	9	77	98
S10	18	G	4	3	F	5	4	5	5	4	3	9	5	86	53
S11	19	-	4	3	F	7	5	6	6	10	10	9	10	82	90
S12	35	-	2	1	M	9	6	7	7	9	9	9	9	57	61
S13	21	-	4	3	F	5	4	5	5	7	9	10	9	37	73
S14	21	-	2	3	F	5	5	6	5	10	10	10	10	37	73
S15	21	-	1	3	F	4	4	4	4	8	9	7	8	69	49

F2200	AGE	TL	HC	UC	S	P	G	V	AV1	M	E	I	AV2	AC	RJ
F1	22	-	0	3	F	4	5	4	4	7	9	7	8	94	72
F2	18	S	0	1	F	8	5	4	6	9	9	7	8	100	36
F3	21	G	0	2	M	2	5	1	3	8	8	8	8	84	100
F4	20	-	2	2	F	6	6	4	5	8	8	5	7	100	88
F5	20	S	0	2	F	2	2	3	2	8	9	9	9	84	84
F6	19	-	3	1	F	6	5	4	5	8	8	7	8	80	52
F7	18	G	3	1	F	7	6	6	6	8	8	8	8	96	76
F8	19	-	4	1	F	4	6	6	5	8	9	6	8	80	84
F9	19	-	3	2	F	7	4	6	6	8	10	7	8	76	76
F10	21	-	4	2	M	8	8	6	7	9	9	6	8	88	40
F11	20	-	0	2	F	4	5	5	5	10	10	10	10	96	76
F12	19	-	2	2	F	7	6	6	6	9	9	9	9	68	64
F13	20	-	3	2	F	8	5	3	5	7	8	8	8	76	76
F14	20	-	4	2	F	7	7	5	6	10	10	8	9	76	80
F15	19	-	3	2	F	3	4	6	4	10	10	10	10	80	88

F3300	AGE	TL	HC	UC	S	P	G	V	AV1	M	E	I	AV2	AC	RJ
F1	22	-	4	3	F	4	2	2	3	8	9	6	8	92	84
F2	20	-	4	3	F	6	6	4	5	8	10	8	9	88	60
F3	20	-	3	3	F	2	5	4	4	7	8	8	8	100	80
F4	19	S	4	3	F	7	6	6	6	9	9	9	9	80	68
F5	20	-	4	3	F	5	6	5	5	6	7	6	6	88	80
F6	21	-	2	3	M	8	9	5	7	10	10	7	9	68	96
F7	18	-	3	2	F	8	5	7	7	10	7	10	9	84	36
F8	21	-	4	3	F	4	5	3	4	5	7	8	7	80	80
F9	20	S	2	3	F	6	5	6	6	9	10	9	9	84	68
F10	19	-	4	3	F	8	5	5	6	6	7	9	7	96	96
F11	20	-	4	2	F	6	4	5	5	5	7	8	7	80	52
F12	30	-	1	3	M	8	5	7	7	9	5	8	7	76	72
F13	21	R	0	3	M	9	8	7	8	9	9	8	9	92	72
F14	19	-	4	1	F	5	7	7	6	10	10	8	9	80	72
F15	27	-	1	3	F	7	4	5	5	8	7	8	8	92	80

F4000	AGE	TL	HC	UC	S	P	G	V	AV1	M	E	I	AV2	AC	RJ
F1	26	G	0	4	M	7	4	5	5	8	10	8	9	96	44
F2	22	-	3	4	F	5	8	4	6	9	9	7	8	96	76
F3	21	-	3	4	F	6	5	7	6	8	8	8	8	100	76
F4	20	-	0	2	F	7	8	4	6	8	9	10	9	100	72
F5	23	-	4	4	M	4	5	5	5	10	10	7	9	72	80
F6	26	-	2	4	F	7	6	6	6	9	10	10	10	88	68
F7	22	-	2	4	F	6	2	3	4	4	7	8	6	96	76
F8	20	-	3	4	F	5	7	6	6	9	10	10	10	92	60
F9	22	G	2	3	F	3	5	4	4	8	9	8	8	72	80
F10	21	-	3	4	M	7	7	6	7	9	10	7	9	84	100
F11	19	I	3	2	F	6	7	5	6	10	10	10	10	100	68
F12	21	S	0	4	F	7	7	6	7	9	10	8	9	96	60
F13	22	-	4	4	F	7	6	6	6	9	10	8	9	96	88
F14	20	-	4	3	F	5	7	6	6	9	10	8	9	84	88
F15	20	S	3	2	M	8	7	8	8	10	10	10	10	84	88

APPENDIX F
BACKGROUND DATA CORRELATIONS

Note: df within groups is always 13

Age versus accepted correctly

```
-------------------------- F2200 -------------------------
Source         DF      F Value     Pr > F       r          ACC Mean
Between         1        0.05      0.8196       0.064         85.20
-------------------------- F3300 -------------------------
Source         DF      F Value     Pr > F       r          ACC Mean
Between         1        0.20      0.6591       0.124         85.33
-------------------------- F4000 -------------------------
Source         DF      F Value     Pr > F       r          ACC Mean
Between         1      0.29        0.6002       0.147         90.40
-------------------------- FNS ---------------------------
Source         DF       F Value     Pr > F      r          ACC Mean
Between         1         0.01      0.9139      0.031         98.13
-------------------------- S2200 -------------------------
Source         DF       F Value     Pr > F      r          ACC Mean
Between         1         0.60      0.4514      0.210         71.40
-------------------------- S3300 -------------------------
Source         DF       F Value     Pr > F      r          ACC Mean
Between         1         0.05      0.8239      0.063         71.93
-------------------------- S4000 -------------------------
Source         DF       F Value     Pr > F      r          ACC Mean
Between         1         1.20      0.2925      0.291         72.86
-------------------------- SNS ---------------------------
Source         DF       F Value     Pr > F      r          ACC Mean
Between         1         0.32      0.5830      0.154         87.26
```

Age versus rejected correctly

```
-------------------------- F2200 -------------------------
Source         DF       F Value     Pr > F      r          REJ Mean
Between         1         0.63      0.4412      0.215         72.80
-------------------------- F3300 -------------------------
Source         DF       F Value     Pr > F      r          REJ Mean
Between         1         0.59      0.4560      0.208         73.06
-------------------------- F4000 -------------------------
Source         DF       F Value     Pr > F      r          REJ Mean
Between         1         2.23      0.1589      0.383         74.93
```

```
-------------------------- FNS --------------------------
Source          DF      F Value    Pr > F      r       REJ Mean
Between          1         1.16    0.3006    0.286        94.66
------------------------- S2200 -------------------------
Source          DF      F Value    Pr > F      r       REJ Mean
Between          1         0.24    0.6352    0.134        74.40
------------------------- S3300 -------------------------
Source          DF      F Value    Pr > F      r       REJ Mean
Between          1         0.09    0.7744    0.081        66.73
------------------------- S4000 -------------------------
Source          DF      F Value    Pr > F      r       REJ Mean
Between          1         1.21    0.2911    0.292        70.40
-------------------------- SNS --------------------------
Source          DF      F Value    Pr > F      r       REJ Mean
Between          1         0.79    0.3899    0.240        90.60
```

AV1 versus correctly rejected

```
------------------------- F2200 -------------------------
Source          DF      F Value    Pr > F      r       REJ Mean
Between          1         7.68    0.0159    0.610        72.80
------------------------- F3300 -------------------------
Source          DF      F Value    Pr > F      r       REJ Mean
Between          1         0.51    0.4861    0.195        73.06
------------------------- F4000 -------------------------
Source          DF      F Value    Pr > F      r       REJ Mean
Between          1         0.81    0.3852    0.242        74.93
------------------------- S2200 -------------------------
Source          DF      F Value    Pr > F      r       REJ Mean
Between          1         1.13    0.3077    0.282        74.40
------------------------- S3300 -------------------------
Source          DF      F Value    Pr > F      r       REJ Mean
Between          1         1.26    0.2823    0.297        66.73
------------------------- S4000 -------------------------
Source          DF      F Value    Pr > F      r       REJ Mean
Between          1         1.27    0.2804    0.298        70.40
```

AV2 versus correctly rejected

```
------------------------- F2200 -------------------------
Source          DF      F Value    Pr > F      r       REJ Mean
Between          1         0.30    0.5928    0.150        72.80
------------------------- F3300 -------------------------
Source          DF      F Value    Pr > F      r       REJ Mean
Between          1         1.03    0.3291    0.271        73.06
------------------------- F4000 -------------------------
Source          DF      F Value    Pr > F      r       REJ Mean
Between          1         0.21    0.6527    0.127        74.93
```

```
-------------------------- S2200 -------------------------
Source        DF      F Value     Pr > F       r       REJ Mean
Between        1         0.99     0.3379     0.266        74.40
-------------------------- S3300 -------------------------
Source        DF      F Value     Pr > F       r       REJ Mean
Between        1         2.42     0.1441     0.396        66.73
-------------------------- S4000 -------------------------
Source        DF      F Value     Pr > F       r       REJ Mean
Between        1         1.99     0.1820     0.364        70.40
```

AV1 versus correctly accepted

```
-------------------------- F2200 -------------------------
Source        DF      F Value     Pr > F       r       ACC Mean
Between        1         0.00     0.9691     0.011        85.20
-------------------------- F3300 -------------------------
Source        DF      F Value     Pr > F       r       ACC Mean
Between        1         2.17     0.1641     0.379        85.33
-------------------------- F4000 -------------------------
Source        DF      F Value     Pr > F       r       ACC Mean
Between        1         0.42     0.5270     0.177        90.40
-------------------------- S2200 -------------------------
Source        DF      F Value     Pr > F       r       ACC Mean
Between        1         0.06     0.8157     0.066        71.40
-------------------------- S3300 -------------------------
Source        DF      F Value     Pr > F       r       ACC Mean
Between        1         1.53     0.2381     0.324        71.93
-------------------------- S4000 -------------------------
Source        DF      F Value     Pr > F       r       ACC Mean
Between        1         3.35     0.0902     0.453        72.86
```

AV2 versus correctly accepted

```
-------------------------- F2200 ------------------------
Source        DF      F Value     Pr > F       r       ACC Mean
Between        1         1.02     0.3303     0.270        85.20
-------------------------- F3300 -------------------------
Source        DF      F Value     Pr > F       r       ACC Mean
Between        1         0.27     0.6107     0.143        85.33
-------------------------- F4000 -------------------------
Source        DF      F Value     Pr > F       r       ACC Mean
Between        1         0.08     0.7765     0.080        90.40
-------------------------- S2200 -------------------------
Source        DF      F Value     Pr > F       r       ACC Mean
Between        1         0.98     0.3409     0.264        71.40
-------------------------- S3300 -------------------------
Source        DF      F Value     Pr > F       r       ACC Mean
Between        1         0.33     0.5726     0.158        71.93
```

```
--------------------------- S4000 --------------------------
Source          DF      F Value     Pr > F       r         ACC Mean
Between          1         0.02     0.8960       0.037        72.86
```

AA versus correctly accepted

```
--------------------------- FNS ----------------------------
Source          DF      F Value     Pr > F       r         ACC Mean
Between          1         2.82     0.1169       0.422        98.13
--------------------------- SNS ----------------------------
Source          DF      F Value     Pr > F       r         ACC Mean
Between          1         0.88     0.3657       0.252        87.26
Within          13
```

LR versus correctly accepted

```
--------------------------- FNS ----------------------------
Source          DF      F Value     Pr > F       r         ACC Mean
Between          1         0.00     1.0000       .000         98.13
--------------------------- SNS ----------------------------
Source          DF      F Value     Pr > F       r         ACC Mean
Between          1         1.38     0.2614       0.310        87.26
```

YFE versus correctly accepted

```
--------------------------- FNS ----------------------------
Source          DF      F Value     Pr > F       r         ACC Mean
Between          1         0.86     0.3699       0.249        98.13
--------------------------- SNS ----------------------------
Source          DF      F Value     Pr > F       r         ACC Mean
Between          1         1.63     0.2240       0.334        87.26
```

AA versus correctly rejected

```
--------------------------- FNS ----------------------------
Source          DF      F Value     Pr > F       r         REJ Mean
Between          1         0.43     0.5233       0.179        94.66
--------------------------- SNS ----------------------------
Source          DF      F Value     Pr > F       r         REJ Mean
Between          1         1.93     0.1876       0.360        90.60
```

LR versus correctly rejected

```
--------------------------- FNS ----------------------------
Source          DF      F Value     Pr > F       r         REJ Mean
Between          1         1.44     0.2513       0.316        94.66
--------------------------- SNS ----------------------------
Source          DF      F Value     Pr > F       r         REJ Mean
Between          1         1.07     0.3198       0.276        90.60
```

YFE versus correctly rejected

```
--------------------------- FNS ----------------------------
Source          DF        F Value     Pr > F       r          REJ Mean
Between          1           0.00     0.9480       0.018         94.66
--------------------------- SNS ----------------------------
Source          DF        F Value     Pr > F       r          REJ Mean
Between          1           0.04     0.8427       0.056         90.60
```

APPENDIX G
STIMULI

1 - * Qui Jean donne t-il le livre à?
2 - * Qui Marie sort-elle avec?
3 - * Qui Eric parle t-il à?
4 - * Qui Jean joue t-il avec?
5 - * Qui Jean vote t-il pour?
6 - A qui Jean donne t-il le livre?
7 - De qui Marie parle-elle?
8 - A quoi Eric pense t-il?
9 - Avec qui Paul joue t-il?
10 - Pour qui Jean travaille t-il?
11 - * C'est la raquette que je joue avec
12 - * C'est l'examen que j'étudie pour
13 - * C'est le candidat qu'ils votent pour
14 - * C'est l'ami que j'écris à
15 - * C'est l'homme que je sors avec
16 - C'est le ballon avec lequel je joue
17 - C'est l'examen pour lequel j'étudie
18 - C'est la personne pour qui ils travaillent
19 - C'est l'ami à qui j'écris
20 - C'est la fille avec qui je danse
21 - * Je crois Jean être en retard
22 - * Elle pense son père être intelligent
23 - * Je considère mes étudiants être sérieux
24 - * Jean pense Anne être jolie
25 - * Eric croit l'enfant être malade
26 - Quel président juges-tu raisonable?
27 - Quel professeur crois-tu compétent?
28 - Quel garçon juges-tu intelligent?
29 - Quelle idée trouvez-vous bonne?
30 - Quel film trouves-tu intéressant?
31 - * Ils ont donné l'enfant un jouet
32 - * J'ai dit Marc la vérité
33 - * Marc a envoyé son cousin un paquet
34 - * Eric prête son frère le vélo
35 - * Jean a donné un livre à Marie
36 - Ils ont donné un jouet à l'enfant
37 - J'ai dit la vérité à Marc
38 - Tom a envoyé un paquet à son cousin
39 - Bill prête le vélo à son frère
40 - Jean a offert un cadeau à Pierre
41 - * L'enfant a été donné un jouet

42 - * Marc a été dit le message
43 - * Son cousin a été envoyé un paquet
44 - * Eric a été prêté un stylo
45 - * Pierre a été offert un livre
46 - Un châlet a été construit pour Jean
47 - Un repas a été cuit pour les enfants
48 - Le cadeau a été offert à Eric
49 - Un message a été envoyé à Jean
50 - Le bureau a été acheté pour Marc

1 - * ¿Quién le da Juan el libro a?
2 - * ¿Quién sale Maria con?
3 - * ¿Quién habla Bill con?
4 - * ¿Quién juega Juan con?
5 - * ¿Quién vota Juan por?
6 - ¿A quién le da Juan el libro?
7 - ¿De quién habla Maria?
8 - ¿A qué piensa Bill?
9 - ¿Con quién juega Juan?
10 - ¿Para quién trabaja Juan?
11 - * Es la raqueta que juego con
12 - * Es el examen que estudio para
13 - * Es el candidato que votan por
14 - * Es el amigo que escribo a
15 - * Es el hombre que salgo con
16 - Es el balón con el cual jüego
17 - Es el examen para el cual estudio
18 - Es la persona para quien trabajan
19 - Es el amigo a quien escribo
20 - Es la chica con quien salgo
21 - * Creo Juan estar atrasado
22 - * Piensa su padre ser inteligente
23 - * Considero mis estudiantes ser serios
24 - * Juan piensa Maria estar hermosa
25 - * Marcos cree el chico estar enfermo
26 - ¿Qué presidente juzgas racional?
27 - ¿Qué profesor crees competente?
28 - ¿Qué chico juzgas inteligente?
29 - ¿Qué idea te parece original?
30 - ¿Qué pelócula te parece interesante?
31 - * Han dado el niño un juguete
32 - * He dicho Marcos la verdad
33 - * Marcos ha mandado su primo un paquete
34 - * Eric presta su hermano la bicicleta
35 - * Juan ha dado Pedro un libro
36 - Le dan un juguete al niño
37 - Le he dicho la verdad a Marcos
38 - Juan le ha mandado un paquete a su primo
39 - Eric le presta la bicicleta a su hermano
40 - Juan le ha ofrecido un coche a Maria
41 - * El niño fue dado un juguete

42 - * Marcos fue dicho el mensaje
43 - * Su primo fue mandado un paquete
44 - * Eric fue prestado un bolígrafo
45 - * Juan fue dado un libro
46 - Un chalete fue construido para Juan
47 - El almuerzo fue preparado para los niños
48 - El libro fue dado a Pedro
49 - Un mensaje fue mandado a Juan
50 - El despacho fue comprado para Marcos

APPENDIX H
INSTRUCTIONS

Grammaticality Judgment task

WELCOME TO THE EXPERIMENT !

Please read the following instructions carefully :

You will be presented with one sentence at a time. Indicate whether you think that they are acceptable or not on a scale from 1 to 4 by pressing a key from 1 to 4:

1 - completely unacceptable
2 - unacceptable
3 - acceptable
4 - completely acceptable

WE ARE INTERESTED IN YOUR FIRST JUDGMENT.

PROCEED QUICKLY AND DO NOT THINK TOO HARD !
THERE ARE NO ERRORS OF WORD CHOICE, SPELLING, ACCENT, TENSE ON CONJUGATED VERBS OR AGREEMENT.

PRESS ENTER TO START THE EXPERIMENT

Correction task

You will be presented with some unacceptable sentences one at a time. Rewrite them the way you think they should be. Use the BACKSPACE key to edit your sentence, and do not worry about typing in accents (the computer won't accept them).

APPENDIX I
PROBABILITY TABLE

(A)	(B)	(C)	(D)
SCORE	Percentage	p	Cumulative Score
25	100%	.00000003	.00000003
24	96%	.0000007	.0000008
23	92%	.00004	.00004
22	88%	.0001	.0001
21	84%	.0004	.0005
20	80%	.002	.002
19	76%	.005	.007
18	72%	.01	.02
17	68%	.03	.05
16	64%	.06	.11
15	60%	.10	.21
14	56%	.13	.34
13	52%	.16	.50
12	48%	.16	.66
..	..	..	..
..	..	..	..

The column (A) labeled "score" represents the 25 ungrammatical or grammatical sentences of the stimuli. For example, 23 means that a subject correctly rejected or accepted 23 sentences out of the 25 sentences.

The column (B) is the percentage corresponding to the score. So if a subject correctly accepts 23 grammatical sentences out of 25, his percentage for correctly accepting grammatical sentences will be 92%.

The column (C), labeled p, is the probability of getting an exact score by chance, i.e. by guessing.

The column (D), labeled cumulative score, is the probability of obtaining a particular score or better.

This appendix explains how one arrives at 68% as the better than chance performance percentage. The following considerations are necessary :

- 25 sentences are evaluated since the stimuli consisted of 25 grammatical and 25 ungrammatical sentences.
- each sentence was independent of the others, i.e. each sentence was evaluated separately.
- only two possible outcomes were considered (1 or 2 if the sentence was ungrammatical and 2 or 3 if the sentence was grammatical) and these outcomes were weighted equally.

The following counting principle was used:

> If there are X ways of A occurring and X ways
> of B occurring then there are (X)(Y) of both
> A and B occurring.

Therefore there are 2^{25} ways to evaluate the 25 sentences. These distinct outcomes are referred to as evaluations. The term score will refer either to the number of sentences correctly evaluated, i.e. correctly rejected or correctly accepted, or to the percentage score which is the score/25 x 100%. Usage will be clear from the context.

The probability of getting any single evaluation is $1/2^{25}$, but for each score there is an associated multiplicty which will be called the choose factor. The probablity of getting a particular score by guessing is $1/2^{25}$ times the choose factor for that score. For example, the probability of correctly rejecting 96% of the sentences by guessing is $25.(1/2^{25})$ or about 7 in 10,000,000.

The probability of getting a particular score or better is the sum of the probabilities for this score and all scores above this score. For example, the probability of correctly rejecting 100% of the sentences is $1/2^{25}$, so the probability of obtaining 96% or better is $(25).(1/2^{25}) + 1/2^{25}$ or about 8 in 10,000,000.

The better than chance percentage is then defined as the percentage score for which the probability of obtaining this score or better by chance is less than or equal to .05, $p >/ .05$ is the traditional value chosen for establishing statistical significance.

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Dalila Ayoun was born in Antibes, France, on August 7, 1963. She graduated from the University of Nice with a B.A. in English in 1984. Dalila first came to the United States as an foreign exchange student in 1984 and obtained a Certificate of Translation and Interpretation in French and Spanish at the University of Nebraska at Kearney. She graduated with a M.A. in International Studies from the same institution in 1987. Dalila was admitted into the Ph.D. program in French at the University of Florida in August 1987 to graduate in August 1992. On May 12, 1990, Dalila married Robert S. Clancy who is pursuing a Ph.D. in mathematics at the University of Florida. During her doctoral work, Dalila held a teaching assistantship which allowed her to teach beginning and intermediate classes of French. During her last two terms, Spring and Summer 1992, she was selected as a recipient of a Graduate School Humanities Fellowship. Her interests include second language acquisition, linguistics, bilingualism, and computer technology applied to language teaching and language learning.

I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Philosophy.

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